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	TRANSMITTAL LETTER T		PC10433A
	PATENT AND TRA		
	DESIGNATED/ELECTE CONCERNING A FILING	` ,	U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5) filed herewith via EXPRESS MAIL LABEL EE 645346652 US
INTERN PCT/US0	ATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE February 25, 2000	PRIORITY DATE CLAIMED February 26, 1999
	OF INVENTION	reducity 23, 2000	1 coluary 20, 1999
		OVERY, AND SPORULATION OF CYSTS A	ND OOCYSTS
	ANT(S) FOR DO/EO/US		
		cott J. BLONIGEN; Fred H. WEBER; David ! A.I. McARTHUR; and Ted L. TEWKSBURY	R KILANOWSKI; Bruce MONZYK; Timothy
Applicant	herewith submits to the United State	s Designated/Elected Office (DO/EO/US) the f	ollowing items and other information:
1. 🖂	This is the FIRST submission of ite	ems concerning a filing under 35 U.S.C. 371.	
2.	This is the SECOND or SUBSEQ	UENT submission of items concerning a filing	under 35 U.S.C. 371.
3. 🖂		al examination procedures (35 U.S.C. 371(f)) a the applicable time limit set in 35 U.S.C. 371(b)	
4. 🛛	A proper Demand for International	Preliminary Examination was made by the 19 th	month from the earliest claimed priority date.
5. 🖂	A copy of the International Applica	tion as filed (35 U.S.C. 371(c)(2))	
	a is transmitted he	rewith (required only if not transmitted by the I	international Bureau).
		tted by the International Bureau.	
	-	s the application was filed in the United States	Receiving Office (RO/US).
6.		oplication into English (35 U.S.C. 371(c)(2)).	
7. 🖂		ternational Application under PCT Article 19 (
		perewith (required only if not transmitted by the	e International Bureau).
		nitted by the International Bureau. ade; however, the time limit for making such a	mandments has NOT avaited
		ade and will not be made.	menuments has NOT expired.
8.		the claims under PCT Article 19 (35 U.S.C 37	1(c)(3))
9.		or(s) (35 U S.C. 371(c)(4)) In Unexecuted F	
10.		nternational Preliminary Examination Report u	
Items 11.	To 16. Below concern other docum	nents(s) or information included:	
11. 🖂	An Information Disclosure Statem	ent under 37 C.F.R. 1.97 and 1.98 with Form A	.820/1449; copies of 8 references.
12.	An assignment document for recor	ding A separate cover sheet in compliance wit	h 37 C.F.R. 3.28 and 3.31 is included.
13.	A FIRST preliminary amendment		
	A SECOND or SUBSEQUENT p	oreliminary amendment.	
14.	A substitute specification.		
15.	A change of power of attorney and	l/or address letter.	
16.	Other items or information:		
	Copy of International Search Repo	ort	
	Copy of Invitation to Pay Additon	al Fees for Multiple Inventions	
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	Certificate of Mailing via Express	•	
	Return Receipt Postcard		
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U.S. APPL	ICATION	NO. (If known, see 37 CFR 1.	5)	INTERNATIO	NAL A	PPLIC	CATION NO			ATTODNEY	'S DOCKET NUMBER
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17.	The	following fees are subm	itted				-		CALC	JLATIONS	PTO USE ONLY
BASIC	NATIO	NAL FEE (37 CFR 1.4	92 (a)(1)-(5)):							
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	Internat	tional preliminary examinat	ion fee paid	to USPTO (37	CFR 1	.482)	\$6	90.00			
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10017-5755

E. Victor Donahue

Registration Number 35,492

Attorney Docket No.PC10433A

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail in an envelope addressed to: Assistant Commissioner for Patents, Box PCT, Washington, D.C. 20231 on this 30 day of November 2000. Ву E. Victor Donahue (Typed or printed name of person) IN THE UNITED STATES PATENT AND TRADEMARK OFFICE IN RE APPLICATION OF: Conkle et al. Examiner: Not Yet Assigned APPLICATION NO.: Express Mail Label EE 645346652 US Group Art Unit:Not Yet Assigned FILING DATE: November 30, 2000 TITLE: Method for the Purification. Recovery, and Sporulation of Cysts and Oocysts. Assistant Commissioner for Patents, Box PCT Washington, D.C. 20231 Sir:

Preliminary Amendment

At page 1 of the Specification, on blank line No. 2 (directly beneath the Title Sentence), please insert the following paragraph.

-- The present application is the United States national stage (35 USC 371) of International Application PCT/US00/04733, internationally filed on February 25, 2000. The present national application claims priority under 35 USC 119(e) to U.S. Provisional Application 60/122,160, filed February 26, 1999, the complete text, claims and figures of which are incorporated by reference herein, as if fully set forth. --

Respectfully submitted,

Date: 1/-30-00

E. Victor Donahue

Attorney for Applicant(s)

2. LUN

Reg. No. 35,492

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Method For The Purification, Recovery, And Sporulation of Cysts And Oocysts

Background of the Invention

This invention relates generally to methods for the purification, recovery, and sporulation of encysted protozoa for use in the production of vaccines. Protozoa are pathogens known to attack the gastrointestinal tract of the host. In a situation where the host has a weak or suppressed immune system, such as very young, very old, and immuno-compromised hosts, infection may be fatal. Such a loss can translate into an economic loss as well. Protozoa are present in the environment in a relatively stable cyst form, also termed an oocyst when the protozoa is a sporozoa. Upon ingestion into the host, the encysted protozoa responds to the conditions of the gastrointestinal tract and infects the host.

In order to prevent or alleviate the problem of these diseases, non-in-ovo vaccines have been developed. These vaccines typically expose the host to a low level of the protozoa in order to develop immunity in the host without causing disease. Such vaccines include a vaccine against avian coccidiosis caused from any one of a number of species of coccidia (U.S. Patent No. 5,055,292), a vaccine for cats against toxoplasma (U.S. Patent No. 5,045, 313), and vaccines for pigs and other ruminants (U.S. Patent No. 4,808,404). These vaccines are only partially effective because they must be given by gavage or applied to the water or the food of the animal. Gavage is ineffective because it requires manual vaccine introduction. Also, many chicks die due to handling. Adding the vaccine to the food or water is also ineffective as young chicks eat little directly after hatching; therefore, disease control is delayed. The result is less rapid weight gain and a longer time to reach market weight.

In order to produce the vaccine, a supply of adequately purified encysted protozoa must be obtained. Current separation and recovery techniques employ corrosive, hazardous, toxic materials. Measures must be undertaken to compensate for these materials such as extensive washing operations to remove these materials which results in low product yield. The typical method of obtaining the encysted protozoa includes obtaining a source of encysted protozoa, such as the intestines or feces of infected animals. The intestinal matter or fecal matter needs to be separated from the encysted protozoa, and a flotation method is used. Heavy media flotation or sedimentation processes have been used where the heavy media is sodium chloride (U.S. Patent No. 4,863,731) or sucrose (U.S. Patent No. 5,068,104). The heavy media is used in an aqueous mixture. Unfortunately, the use of aqueous mixtures of the heavy media can have adverse effects. For example, aqueous mixtures of sodium chloride can lead to severe equipment corrosion.

Before the encysted sporozoa can become infective, the separated oocysts must be sporulated by mild oxidation. Mild oxidation is accomplished by either placing the suspension on a shaking table or bubbling air through the suspension of the oocysts. Potassium dichromate is typically employed to suppress any unwanted microbial growth during sporulation. But, potassium

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dichromate is a hazardous material. Its use creates handling and disposal problems. Its removal results in reduced yield and increased costs.

A final bleaching step using sodium hypochlorite is used to eliminate any remaining organic material and undesired microorganisms. The bleached encysted protozoa must be washed to reduce the residual bleaching agent concentration to an acceptable level. Washing is accomplished by a series of dilutions and oocyst recovery operations to reduce the bleaching agent levels while producing an oocyst concentrate. The final encysted protozoa concentrate is made into a vaccine under sterile conditions. Each vaccine may include multiple species of protozoa to provide the greatest amount of protection possible.

A need exists for a more efficient vaccination method. Such a vaccination method would employ a live vaccine dosed at a level sufficient to generate an immuno-response to build immunity but low enough not to cause acute symptoms. For example, an in-ovo vaccine against avian coccidiosis can shorten treatment times and allow a more uniform dosage. This method could also be used to collect and produce human vaccines for protection against protozoa including *Cryptosporidium* and *Giardia lamblia*. The method would employ a non-corrosive dense media flotation process or a gas flotation process that eliminates the need for salt entirely. This improved method would not use a hazardous biocide such as potassium dichromate. Such an alternative biocide or oxidant could also double as a bleaching agent, eliminating another step in the process and another hazardous compound.

Summary of the Invention

The present invention is directed to a method for the purification and recovery of encysted protozoa, including separating the encysted protozoa from a suspension containing the encysted protozoa by either a salt flotation process where the salt is salts such as sodium sulfate, magnesium sulfate, magnesium chloride, calcium chloride, or mixtures thereof, or a gas flotation process.

In one embodiment, the method of separating the encysted protozoa is accomplished by a salt flotation process and the salt is sodium sulphate. In this embodiment, the method includes preparing an admixture comprising the encysted protozoa and the sodium sulphate, centrifuging the slurry and recovering a supernatant therefrom, forming a dilution of the supernatant and centrifuging the dilution, and recovering the concentrate from the centrifuged dilution. This embodiment may also include homogenizing the admixture by high intensity homogenization. The sodium sulphate is present in the admixture in an amount from about 3 to about 30 weight percent. Further, the specific gravity of the dilution may be less than the specific gravity of the encysted protozoa. The concentrate comprises from about 1x10⁴ to about 1.5x10⁶ encysted protozoa/ml.

In another embodiment, separation of the encysted protozoa is accomplished by the gas flotation process. The gas flotation process includes adjusting the suspension to a pH sufficient to affect adhesion between bubbles of the gas in the suspension and the encysted protozoa, conditioning the pH adjusted suspension by adding a sufficient amount of a surface active agent

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compound to selectively coat particles in the suspension and a sufficient amount of a heteropolar compound to produce a stable froth, passing the conditioned suspension through at least one gas flotation cell, and recovering the encysted protozoa from the gas flotation cell. Suitable gases include air. When the gas is air, the pH can be adjusted to about 2.5 to about 3.5. The surface active agent compounds include a sodium salt of long-chain alkyl hydrogen sulfate, a quaternary ammonium compound, a blend of a fatty ammonium acetate and 2-ethylhexanol, an ester/amide compound, an alkyloxy polyethylenoxyethanol, and mixtures thereof. The heteropolar compounds include amyl alcohols, butyl alcohols, terpinols, cresols, and mixtures thereof. Suitable gas flow rates for the gas flotation cell range from about 0.25 to about 1.1 volumes of gas per volume of suspension per minute. In a preferred embodiment, the gas flotation cell comprises at least two serial gas flotation units, and these units can have different gas flow rates.

The present invention is also directed to method for the sporulation of oocysts which includes forming an aqueous suspension of the oocysts with water and hydrogen peroxide, wherein the hydrogen peroxide is present in an amount sufficient to eliminate unwanted microbiological growth, and aerating the aqueous suspension to sporulate the oocysts. The aqueous suspension may be aerated for a time period greater than about 40 hours under conditions such that the aqueous suspension during aeration has a dissolved oxygen level greater than about 80% of the saturation level at a temperature of about 22°C to about 32°C and may have an agitation level sufficient to adequately suspend all the solids. In this embodiment, the aqueous suspension can include an oocyst concentration of about 10⁴ to about 10⁶ oocysts/ml and a hydrogen peroxide concentration of about 1,000 to about 20,000 mg/l.

In a further embodiment, the present invention covers a method for the purification, recovery, and sporulation of oocysts including separating the oocysts from a first suspension comprising the oocysts, and sporulating the separated oocysts by the methods of the present invention. Suitable oocysts are *Eimeria maxima*, *Eimeria mitis*, *Eimeria tenella*, *Eimeria acervulina*, *Eimeria brunetti*, *Eimeria necatrix*, *Eimeria praecox*, and mixtures thereof. In one embodiment, separation of the oocysts is accomplished by a sodium sulfate flotation process which includes preparing an admixture comprising the oocysts and the sodium sulphate, centrifuging the slurry and recovering a supernatant therefrom, forming a dilution of the supernatant and centrifuging the dilution, and recovering the concentrate from the centrifuged dilution.

In another embodiment, separation the oocysts is accomplished by a gas flotation process which includes adjusting the first suspension to a pH sufficient to affect adhesion between bubbles of the gas in the suspension and the encysted protozoa, conditioning the pH adjusted suspension by adding a sufficient amount of a surface active agent compound to selectively coat particles in the suspension and a sufficient amount of a heteropolar compound to produce a stable froth, passing the conditioned suspension through at least one gas flotation cell, and recovering the encysted protozoa from the gas flotation cell. This embodiment may further include adding a bleaching agent to the sporulated oocysts in an amount sufficient to inactivate residual microorganisms and eliminate residual organic matter, and bleaching the sporulated oocysts. In

another embodiment, the bleaching is conducted concurrently with the sporulation, and the bleaching agent is hydrogen peroxide. In yet another embodiment, the bleaching agent is sodium hypochlorite present in an amount from about 5,000 to about 10,000 parts per million free available chlorine, ozone present in an amount up to about 3% in air, and combinations thereof.

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This method may further include washing the bleached oocysts by cross-flow membrane filtration to decrease the residual bleaching agent concentration to an acceptable level. In yet another embodiment, the bleaching agent is sodium hypochlorite present after washing in a concentration sufficient to suppress residual microbial growth, and the bleached and washed oocyst suspension has a concentration from about 1 x 10⁶ to about 2.5 x 10⁶ oocysts/ml, a maximum solids size of less than about 200 microns, and sodium sulphate present in an amount sufficiently low to not interfere with the viability and infectivity of the cysts or oocysts, preferably less that about 3 percent, more preferably less than about 0.9 percent. This method may further include concentrating the bleached and washed oocysts into a sterile concentrate, combining sterile concentrates of one or more species of oocysts into a combined concentrate, and packaging the combined concentrate under sterile conditions.

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Brief Description Of The Drawings

Fig. 1A is a flow chart illustrating embodiments of a first portion method of the present invention;

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Fig. 1B is a flow chart illustrating embodiments of a second portion method of the present invention;

and

Fig. 3 is a plot showing sporulation percent verses time after cyst harvest.

Fig. 2 is a plot showing oocyst concentration verses sodium sulfate concentration;

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Detailed Description Of The Invention

The present method is directed to producing a concentrate of cysts or sporulated oocysts to be utilized in a vaccine. Specifically, the method is directed to producing a concentrate of sporulated avian coccidial oocysts to be used to produce an in-ovo vaccine against coccidiosis. The production of a suitable and acceptable vaccine requires a multi-step treatment process constituting a plurality of unit processes. As shown in Figs. 1A and 1B, the vaccine production process can include taking a suspension of encysted protozoa, homogenizing the suspension, separating the encysted protozoa from the suspension by either salt flotation or gas flotation, sporulating the encysted protozoa if required, bleaching the sporulated encysted protozoa, washing the bleached product, concentrating the encysted protozoa, combining the concentrates from multiple encysted protozoa, and sterile filling to produce a vaccine. These steps are described in further detail below.

Encysted protozoa, which includes cysts and oocysts, may be obtained from various sources including purified suspensions, intestinal linings, and fecal suspensions. Especially when the encysted protozoa are obtained from feces, the suspensions or slurries can include significant

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amounts of undesirable suspended solids. For example, the suspensions can include from about 1 up to about 20 weight percent solids or feces. Preferably, the suspension includes from about 5 to about 20 weight percent solids when salt flotation is used and about 1 weight percent when gas flotation is used. In order to liberate the cysts from the associated organics in the suspension, the suspension may be subjected to a homogenization step. The suspension may be homogenized for a time period from about greater than 0 to about 5 minutes, preferably 1 minute depending upon the intensity of the homogenization. The homogenization conditions should be sufficiently intense to liberate the cysts and oocysts but gentle enough to prevent their destruction.

The encysted protozoa need to be separated from this first suspension, preferably to achieve at least about 70% encysted protozoa recovery and at least about 80% solids rejection. Typically, this results in an encysted protozoa concentration of about 1x10⁴ to about 1.5x10⁶ encysted protozoa/mi. Separation can be achieved by either a salt flotation process or a gas flotation process.

When a salt flotation process is used, an admixture of the unpurified encysted protozoa and the salt is prepared. Suitable salt solutions include dense solutions of water soluble salts including chlorides, sulfates, phosphates, nitrates, and acetates of ammonium, sodium, potassium, calcium, magnesium, and zinc. Suitable highly hydrogen-bonded organics including urea and the salts of guanidiene. Preferably, the salts include sodium sulfate, sodium chloride, magnesium sulfate, magnesium chloride, calcium chloride, and mixtures thereof. More preferably, the salt is sodium sulfate. These salts provide the benefit of being significantly less corrosive to the process equipment. The salt is added in an amount sufficient to produce a difference between the specific gravities of the encysted protozoa and the admixture. Preferably, the specific gravity of the encysted protozoa will be less than the specific gravity of the admixture. The salt is present in an amount from about 3 to about 30 weight percent, preferably about 14 to about 20 weight percent, more preferably about 20 weight percent.

The admixture is then subject to centrifugation and the supernatant and concentrate are collected. Depending upon the admixture conditions, the encysted protozoa can be contained in the supernatant or the concentrate. The admixture is centrifuged at about 3000 to about 15,000g, preferably 12,000g for a period of time necessary to adequately separate the encysted protozoa, typically up to about 10 minutes. For a 20% sodium sulfate solution, the encysted protozoa will be contained in the supernatant; therefore, the supernatant is collected and the concentrate or pellet is directed to waste. As shown in Fig. 2, a sodium sulfate concentration of 20% provides for a high concentration of encysted protozoa (cocysts in this case) in the supernatant (product) and only a small amount of encysted protozoa in the pellet (waste). A dilution is formed by the addition of water to the recovered supernatant. The supernatant is diluted sufficiently so that the specific gravity of the encysted protozoa is more than the specific gravity of the dilution. Therefore, the encysted protozoa will tend to settle in the dilution. For a sodium sulfate concentration of 20%, the ratio of the weight of the dilution to the weight of the supernatant is from about 4 to about 8.

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The dilution is then centrifuged for a second time under comparable centrifugation conditions as in the first centrifugation, such that the residual salt concentration is less than about 10 weight percent, preferably less than about 1 weight percent, and the resulting cyst concentration is about 10⁴ to 10⁶ cysts/ml representing about 80 to about 95 percent recovery. The solid debris rejection rate is preferably about 90 to about 99 percent. In this embodiment, the encysted protozoa are recovered from the concentrate and the supernatant is directed to waste.

In another embodiment, separation of the encysted protozoa is accomplished by a gas flotation process. Preferably the gas is air, although any gas including oxygen and nitrogen could be used. When gas flotation is used, the pH of the suspension is adjusted to a pH sufficient to affect adhesion between the gas bubbles in the suspension and the encysted protozoa by changing the surface chemistry of the encysted protozoa. The pH is typically adjusted to a pH of about 2 to about 9, preferably about 2.5 to 3.5, more preferably about 3.

The pH adjusted suspension is additionally conditioned by the addition of a surface active agent compound, sometimes referred to as a collector compound and a heteropolar compound, sometimes referred to as a frother compound. The surface active agent compound, also termed a selective detergent, wetting agent, or emulsifier, is added in an amount sufficient to promote contact between selected solids and the gas bubbles by forming a thin coating over the particles to be floated, rendering these particles hydrophobic, while not coating other particles. Therefore, through selection of the surface active agent compound, the particles to be floated can be determined. Therefore, the encysted protozoa could be collected in a gas flotation process in which they are floated or in a reverse flotation process in which the solids to be removed are floated. Suitable surface active agents include a sodium salt of long-chain alkyl hydrogen sulfate, a quaternary ammonium compound, a blend of a fatty ammonium acetate and 2-ethylhexanol, an ester/amide compound, an alkyloxy polyethylenoxyethanol, and mixtures thereof. Preferably, the surface active agent compound is sodium lauryl sulfate. The surface active agent should be present in an amount sufficient to coat the particles to be floated. The surface active agent is present in an amount from about 0.5 to 2 lb per ton of solids in the conditioned suspension, preferably 0.5 lb per ton of solids. Alternatively, the surface active agent compound can be about 0.5 lb dodecyl amine per ton of solids which has been acidified with hydrochloric acid until a neutral pH is obtained, or about 0.5 lb potassium salt of oleic acid per ton of solids.

The heteropolar compounds are selected for their ability to change the surface tension of the water and produce stable froths. Typically, these heteropolar compounds contain one or more hydrocarbon groups attached to one polar group, with the hydrocarbon radical having upwards of 5 or 6 carbon atoms. Suitable heteropolar compounds include amyl and butyl alcohols, terpinols, cresols, and mixtures thereof. Preferably, the heteropolar compound is methyl isobutyl carbinol (MIBC) also referred to as methyl amyl alcohol and most accurately referred to as 4-methylpentanol,-2. The heteropolar compound is present in an amount sufficient to produce a stable froth. Preferably, the heteropolar compound is present in an amount up to about 2.0 lb per ton of

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solids, more preferably from about 0.5 to 2.0 lb per ton of solids, most preferably about 0.5 lb per ton of solids.

The conditioned suspension is passed through a gas flotation cell and the encysted protozoa are recovered. Depending upon the pH, surface active agent compound, and heteropolar compound selected, the encysted protozoa may be floated or retained in suspension. Preferably, the encysted protozoa are floated. The gas flotation process is conducted for a period of time and at an air flow rate sufficient to recover about 20 to 100 percent, typically about 85 percent of the encysted protozoa while rejecting about 20 to 90 percent, typically 70 percent of the solid debris. The gas flotation process is conducted for a period of time of about 3 minutes to greater than about 10 minutes, preferably about 10 minutes. The gas flow rate in the air flotation cell is about 0.25 to about 1.1 volumes of gas per volume of solution per minute ("vvm"), preferably about 0.25 to about 0.83 vvm, more preferably about 0.25 to about 0.75 vvm. The gas flotation cell may include a plurality of serial flotation units. Preferably, the gas flotation cell includes at least two serial flotation units. Preferably, the flotation units are gas flotation columns. The gas flow rate in the serial flotation units may be the same or different. Preferably the gas flows are different, for example about 0.47 vvm for a 32 inch high, 2 inch diameter column and about 0.27 vvm for a 60 inch high, 2 inch diameter column.

When the encysted protozoa are oocysts or encysted sporozoa, the oocysts are sporulated. As is shown in Fig. 3, sporulation should occur as soon after harvesting the oocysts as possible, preferably, the oocysts should be sporulated within 3 days after harvest. An aqueous suspension of the oocysts and an oxidant or biocide is prepared, and the aqueous suspension is aerated for a period of time sufficient to sporulate the oocysts. If a salt flotation process was used to separate the oocysts, then the salt concentration during sporulation should be less than about 10 weight percent, preferably less than about 2 weight percent, more preferably less than about 1 weight percent. Preferably, the cyst concentration during sporulation is about 10⁴ to about 10⁶ oocysts/ml, more preferably about 10^5 oocysts/ml. The oocysts should be sporulated within about 1 to 24 hours after recovery of the purified cyst concentrate. The pH of the aqueous suspension should be about 5.0 to 7.0, preferably about 5.2 to 6.8. The temperature of the aqueous suspension in one embodiment is about 20 to about 33 °C, preferably about 22 to about 32 °C, more preferably about 25 to about 29°C, most preferably about 25°C. The aeration rate in one embodiment is about 0.1 to about 10 vvm, preferably about 0.1 to about 2.0 vvm. Overall, the agitation level should be sufficient to fully suspend all solids during sporulation but not enough to destroy the oocysts. This may occur through aeration, shaking, stirring, and combinations thereof. When stirring is used, for example, the stirring should be sufficient to keep the suspended solids in suspension but not enough to destroy the cysts or oocysts. Suitable stirring in a 6 inch diameter vessel can occur at about 121 to 204 rpm, preferably about 197 to 200 rpm, more preferably about 200 rpm. The dissolved oxygen content should be maintained at a level sufficient to permit the oocysts to sporulate, preferably about 80% of the saturation concentration at the given temperature. The time period for sporulation can be

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up to about 72 hours, preferably between about 40 and about 72 hours, more preferably about 48 to about 50 hours.

The oxidant is added in a sufficient amount to inactivate the undesirable microbial growth in the aqueous suspension. Suitable oxidants, or biocides, include hydrogen peroxide, ozone, potassium dichromate, chlorine, and combinations thereof. In one embodiment, the oxidant is potassium dichromate and is present in an amount of about 2.5 v/w percent. In a preferred embodiment, the oxidant is hydrogen peroxide present in an amount from about 1,000 to about 20,000 mg/l, preferably about 5,000 mg/l. Hydrogen peroxide provides the benefit of easier and less expensive handling, and the generation of a hazardous waste by-product from this process is alleviated.

Aeration can be accomplished by either shaking on a shaker table or air sparging in a sporulation tank (e.g. fermentation tank). Preferably, aeration is accomplished in an air sparging tank because the mass transfer of air is greater, thus reducing the time for sporulation and the required size of the equipment.

Following sporulation, if necessary, the oocysts may be washed to reduce the residual oxidant concentration to an acceptable level. Hydrogen peroxide provides the benefit of eliminating the need for this step. Washing may be accomplished by serial washings, preferably, washing is accomplished by membrane filtration, more preferably by diafiltration. In the case of membrane filtration, the membrane pore size is selected to allow passage of solutes through the membrane while restricting the passage of the oocysts from one side of the membrane to the other. In one embodiment, washing is conducted with water at a transmembrane pressure of about up to about 30 psi, preferably about 20 to about 25 psi, a crossflow velocity of up to about 10 m/s, preferably about 2 m/s, and a flux through the membrane of up to about 10 l/min/m², preferably about 3 l/min/m².

The oocysts may be bleached to inactivate residual microorganisms and to eliminate residual organic matter. First, a sufficient amount of a bleaching agent is added, and then the oocysts are bleached or contacted with the bleaching agent for a sufficient period of time. The oocysts may be bleached for a period of up to 1.5 hours. Suitable bleaching agents include sodium hypochlorite, hydrogen peroxide, ozone, and mixtures thereof. The bleaching agent can be initially present in an amount of about 2,000 to about 20,000 mg/l, preferably about 8000 to about 10,000 mg/l, more preferably, 8000 mg/l. The bleaching agent should not be present in an amount sufficient to cause corrosion in the process equipment. When hydrogen peroxide is used for sporulation, bleaching and sporulation may be conducted concurrently. Following bleaching, the bleached suspension is washed, if necessary, to reduce the residual oxidant concentration to an acceptable level. When sodium hypochlorite is the bleaching agent, the acceptable level is less than about 1 mg/l. Washing can be accomplished by either serial washing or diafiltration.

The bleached suspension can be concentrated into a sterile concentration having a concentration high enough for efficient and effective handling. For example, the final concentrated encysted protozoa suspension can include a maximum solids size of less that about 200 microns,

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preferably less than about 25 microns, a salt content of less than about 0.9 percent, a free residual chlorine concentration of less than about 1 mg/l but sufficient to keep residual microbial growth suppressed, and a cyst concentration of about 1×10^6 to 2.5×10^6 cysts/ml.

When numerous encysted protozoa or different species of one genus of encysted protozoa are to be used in a single vaccine, the sterile concentrates from the different species are combined into a single sterile concentrate. For example, the encysted protozoa can be avian coccidial oocysts including *Eimeria maxima*, *Eimeria mitis*, *Eimeria tenella*, *Eimeria acervulina*, *Eimeria brunetti*, *Eimeria necatrix*, *Eimeria praecox*, and mixtures thereof including multiple strains of each. Finally the combined concentrates are subject to filling and packaging under sterile conditions, and a vaccine is produced.

Although preferred embodiments of the present invention have been described, it is understood that the present method can be used to produce other vaccines for numerous types of animal and for humans. This method could, in fact, be used to immunize humans against typical waterborne protozoa such as *Cryptosporidium* and *Giardia lamblia*. Moreover, even though the entire recovery process is described, unit processes thereof may be used independently or inserted into other recovery, monitoring, or treatment schemes without departing from the scope and spirit of the present invention.

The Claims

What is claimed is:

1. A method for the purification and recovery of encysted protozoa, comprising separating the encysted protozoa from a suspension comprising the encysted protozoa by a salt flotation process wherein the salt comprises sulfates, phosphates, nitrates, acetates of ammonium, sodium, potassium, calcium, magnesium, or zinc, hydrogen-bonded organics, the salts of guanidiene, or mixtures thereof, or a gas flotation process.

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2. The method of claim 1, wherein separating the encysted protozoa is accomplished by a sodium sulphate flotation process which comprises:

preparing an admixture comprising the encysted protozoa and the sodium sulphate; centrifuging the slurry and recovering a supernatant therefrom; forming a dilution of the supernatant and centrifuging the dilution; and recovering the concentrate from the centrifuged dilution.

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 The mixture of claim 2, further comprising: homogenizing the admixture by high intensity homogenization.

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- 4. The method of claim 2, wherein the sodium sulphate is present in the admixture in an amount from about 3 to about 30 weight percent.
- 5. The method of claim 2, wherein the specific gravity of the dilution is less than the specific gravity of the encysted protozoa.
 - 6. The method of claim 2, wherein the concentrate comprises from about 1x10⁴ to about 1.5x10⁶ encysted protozoa/ml.
- 7. The method of claim 1, wherein separating the encysted protozoa is accomplished by the gas flotation process which comprises:

adjusting the suspension to a pH sufficient to affect adhesion between bubbles of the gas in the suspension and the encysted protozoa;

conditioning the pH adjusted suspension by adding a sufficient amount of a surface active agent compound to selectively coat particles in the suspension and a sufficient amount of a heteropolar compound to produce a stable froth;

passing the conditioned suspension through at least one gas flotation cell; and recovering the encysted protozoa from the gas flotation cell.

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- 8. The method of claim 7, wherein the gas is air.
- 9. The method of claim 8, wherein the suspension pH is about 2.5 to about 3.5.
- 10. The method of claim 7, wherein the surface active agent compound comprises a sodium salt of long-chain alkyl hydrogen sulfate, a quaternary ammonium compound, a blend of a fatty ammonium acetate and 2-ethylhexanol, an ester/amide compound, an alkyloxy polyethylenoxyethanol, or mixtures thereof.
- 10 11. The method of claim 7, wherein the heteropolar compound comprises amyl alcohols, butyl alcohols, terpinols, cresols, or mixtures thereof.
 - 12. The method of claim 7, wherein the gas flotation cell has a gas rate from about 0.25 to about 1.1 volumes of gas per volume of suspension per minute.
 - 13. The method of claim 7 wherein the gas flotation cell comprises at least two serial gas flotation units.
 - 14. The method of claim 13, wherein the at least two units comprise different gas flow rates.
 - forming an aqueous suspension of the oocysts with water and hydrogen peroxide, wherein the hydrogen peroxide is present in an amount sufficient to eliminate unwanted microbiological growth; and
- aerating the aqueous suspension to sporulate the oocysts.

15. A method for the sporulation of oocysts, comprising:

- 16. The method of claim 15, wherein the aqueous suspension is aerated for a time period greater than about 40 hours such that the aqueous suspension during aeration has a dissolved oxygen level greater than about 80% of the saturation level at a temperature of about 22°C to about 32°C and with an agitation level sufficient to adequately suspend all the solids.
- 17. The method of claim 15 wherein the aqueous suspension comprises an oocyst concentration of about 10⁴ to about 10⁶ oocysts/ml and an initial hydrogen peroxide concentration of about 1,000 to about 20,000 mg/l.
- 18. A method for the purification, recovery, and sporulation of oocysts, comprising: separating the oocysts from a first suspension comprising the oocysts; and sporulating the separated oocysts by the method of claim 14.

- 19. The method of claim 18 wherein the oocysts are *Eimeria maxima*, *Eimeria mitis*, *Eimeria tenella*, *Eimeria acervulina*, *Eimeria brunetti*, *Eimeria necatrix*, *Eimeria praecox*, or combinations thereof.
- 20. The method of claim 18 wherein separating the oocysts is accomplished by a sodium sulfate flotation process which comprises:

preparing an admixture comprising the oocysts and the sodium sulphate; centrifuging the slurry and recovering a supernatant therefrom; forming a dilution of the supernatant and centrifuging the dilution; and recovering the concentrate from the centrifuged dilution.

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21. The method of claim 18 wherein separating the oocysts is accomplished by a gas flotation process which comprises:

adjusting the first suspension to a pH of sufficient to affect adhesion between bubbles of the gas in the suspension and the encysted protozoa;

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conditioning the pH adjusted suspension by adding a sufficient amount of a surface active agent compound to selectively coat particles in the suspension and a sufficient amount of a heteropolar compound to produce a stable froth;

passing the conditioned suspension through at least one gas flotation cell; and recovering the encysted protozoa from the gas flotation cell.

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22. The method of claim 21, further comprising:

adding a bleaching agent to the sporulated oocysts in an amount sufficient to inactivate residual microorganisms and eliminate residual organic matter; and bleaching the sporulated oocysts.

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- 23. The method of claim 22, wherein the bleaching is conducted concurrently with the sporulation, and the bleaching agent is hydrogen peroxide.
- 24. The method of claim 22, wherein the bleaching agent is sodium hypochlorite present in an amount from about 5,000 to about 10,000 parts per million free available chlorine, ozone present in an amount up to about 3% in air, or combinations thereof.
 - 25. The method of claim 22, further comprising washing the bleached oocysts by cross-flow membrane filtration to decrease the residual bleaching agent concentration to an acceptable level.

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26. The method of claim 25, wherein the bleaching agent is sodium hypochlorite present after washing in a concentration sufficient to suppress residual microbial growth, and the bleached and washed cocyst suspension has a concentration from about 1×10^6 to about 2.5×10^6 cocysts/ml, a

maximum solids size of less than about 200 microns, and a sodium sulphate content of less than about 0.9 percent.

27. The method of claim 26 further comprising:

concentrating the bleached and washed oocysts into a sterile concentrate; combining sterile concentrates of one or more species of oocysts into a combined concentrate; and

packaging the combined concentrate under sterile conditions.

Method For The Purification, Recovery, And Sporulation Of Cysts And Oocysts ABSTRACT

A vaccine for in ovo vaccination against avian coccidiosis produced by a method including obtaining the coccidial oocysts from a fecal suspension, homogenizing the fecal suspension, separating the oocysts from the fecal debris by either salt flotation using sodium sulfate or gas flotation using air, sporulating the oocysts using hydrogen peroxide and air sparging, bleaching the sporulated oocysts, washing the bleached oocysts, concentrating the sterile washed oocysts and combining the concentrates of various species of coccidial oocysts, and producing a vaccine. The method in whole or in part can be applied to other kinds of encysted protozoa to produce vaccines for various types of animals.

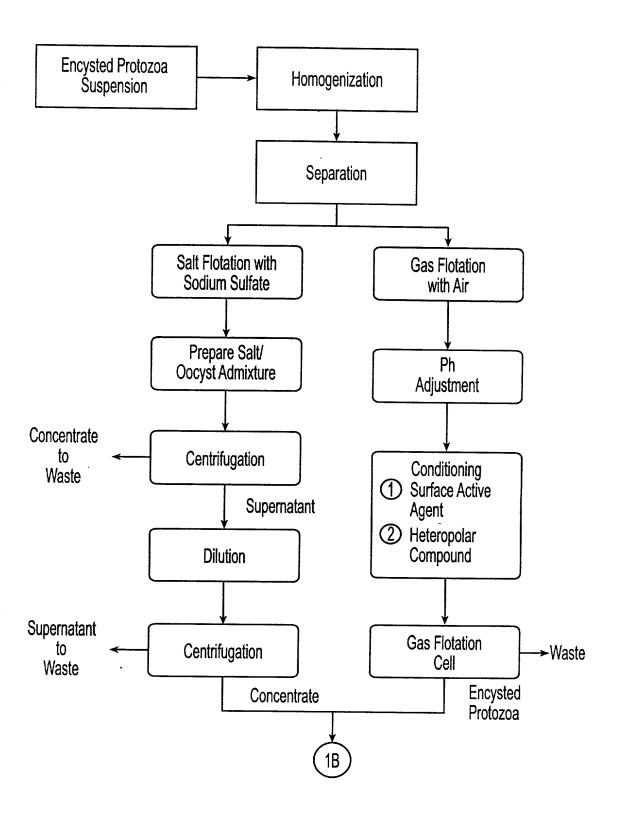
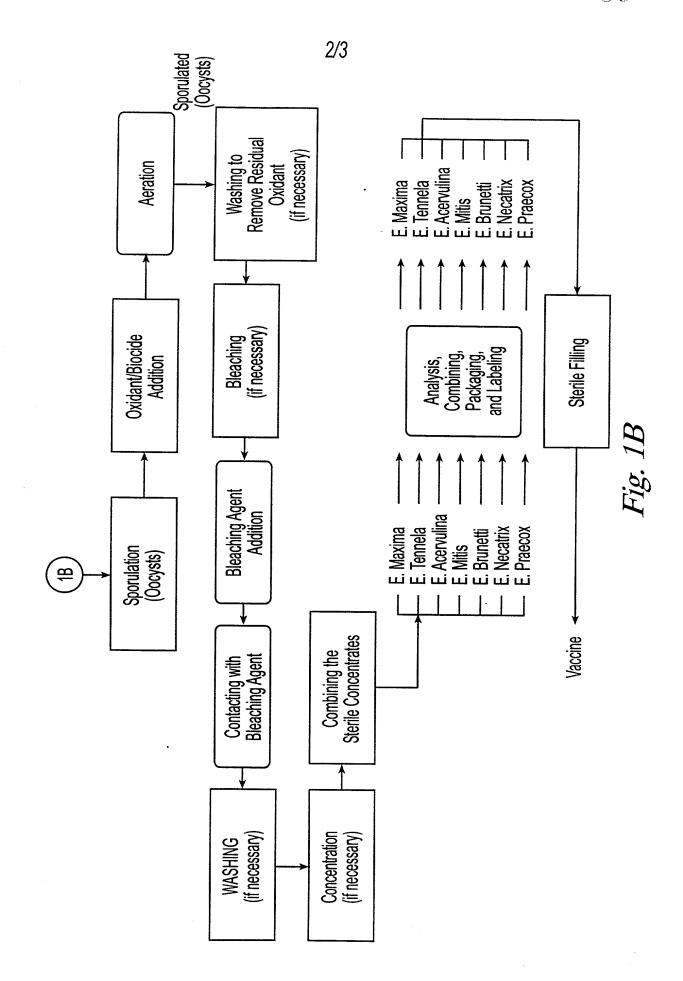


Fig. 1A



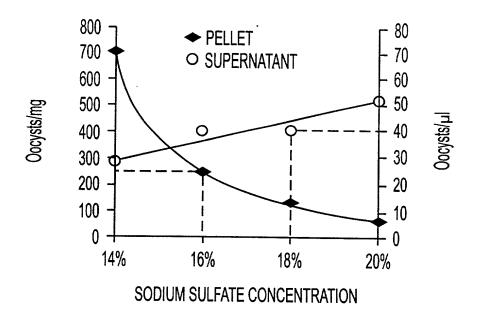


Fig. 2

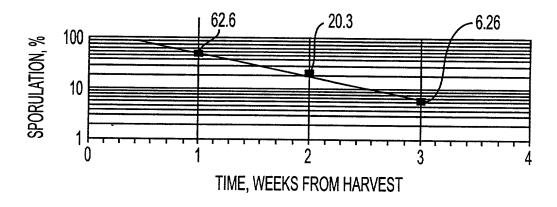


Fig. 3

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DECLARAT	ION FOR UTILITY OR	Attorney Docket Number	PC10433A
	DESIGN	First Named Inventor	Harold N. Conkle
PATEN	IT APPLICATION	COMPLE	TE IF KNOWN
(3	7 CFR 1.63)	Application Number	09/701,760
□ Declaration submitted	Declaration Submitted after Initial	Filing Date	November 30, 2000 (USA) February 25, 2000 (PCT)
with Initial Filing	Filing (surcharge 37 CFR 1.16 (e))	Group Art Unit	Not Yet Assigned
	required)	Examiner Name	Not Yet Assigned

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Additional foreign application	n numbers are list	ed on a supplemental	l priority data she	et PTO/SB/02B at	tached hereto:	
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Peter C. Richa				27,526			A. Dean					31,185
Allen J. Spieg				25,749			Mervin E					32,723
Paul H. Ginsb	•			28,718			Valerie N			1		33,688
J. Trevor Lum James T. Jone				28,567 30,561			Bryan C. Robert T					34,462 36,257
Gregg C. Ben				30,977			B. Timot			1		39,156
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Grover F. Full											35,428	
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Lorraine B. Lir	-		l	35,251		1	Seth H.			- 1		32,140
Garth Butterfie				36,997			Martha A					31,820
Carl J. Godda				39,203		- 1	Gregory					36,647
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Israel Nissenb	•		ļ	27,582			Todd M.					42,208 37,807
Adrian G. Loo				41,406		l	Deborah					44,222
A. David Joran				37,858			Jeffrey N					41,213
Lawrence C A	Akers			28,587			Elsa Dju			j		45,963
Gabriel L. Klei	ıman			40,681		İ	Michelle	A. Sher	wood			36,271
Donna R. Gro	ssu			P-47,248			Arlene K	. Musse	r			37,895
Additional	registered p	eractitioner(s) na	ned on supplei	mentai Regis	tered Pra	actitio	ner Informati	on sheet F	PTO/SB/0	2C atta	ched heret	0
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Name P	Paul H. Gin	sburg										
Address P	Pfizer Inc							······································				
Address 2	35 East 42	2nd Street, 20th	Floor									
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Harold N.					Conkl	le						
Inventor's Signature										Date	;	
Residence: Cit	ty	Columbus		State	Ohio	,	Country	USA		Citiz	enship	USA
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875 Kenridge Court

Columbus

State

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Zip

Additional inventors are being named on the 3 a supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

43220

USA

Country

Post Office Address

City

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DECLARATION

Name of Additional Join	t Inventor, if an	/:	□ Аре	tition has b	een filed for th	is unsigned inve	entor			
Given Name (first and middle [f any])			Family Nam	ne or Surname			
Joseph E.				Schultz						
Inventor's Signature							Date			
Residence: City	Camarillo		State	CA	Country	USA	Citizenship	USA		
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City	Camarillo	Stat	e CA	Zip	Zip 93012 Country USA					
Name of Additional Joint	t Inventor, if any	/:	☐ A pe	tition has b	een filed for thi	is unsigned inve	entor			
Given Name (t	first and middle [i	f any]))			Family Nam	e or Surname	·····		
Scott J.				Blonige	n					
Inventor's Signature							Date			
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Post Office Address						1		 		
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City	Hilliard State OH Zip 43026 Country USA									
Name of Additional Joint	Inventor, if any	<i>'</i> :	☐ A pe	tition has b	een filed for thi	is unsigned inve	entor			
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Fred H.				Weber						
Inventor's Signature							Date			
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Post Office Address										
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City	Terre Haute	Stat	e IN	Zip	47803	Country	USA			
Name of Additional Joint	Inventor, if any	:	☐ A pe	tition has b	een filed for thi	s unsigned inve	ntor			
Given Name (f	irst and middle [i	f any])				Family Nam	e or Surname			
David R.				Kılanow	ski					
Inventor's Signature							Date			
Residence: City	Dublin		State	ОН	Country	USA	Citizenship	USA		
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ADDITIONAL INVENTOR(S) Supplemental Sheet

Name of Additional Joint	t Inventor, if any	: 0	A petit	on has be	en filed for th	is unsigned inve	ntor			
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Bruce				Monzyk						
Inventor's Signature	T		!				Date			
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Name of Additional Joint	t Inventor, if any	: 🗆	A petit	ion has be	en filed for th	s unsigned inve	ntor			
Given Name (f	first and middle [i	f any])				Family Nam	e or Surname			
Timothy M.				Werner						
Inventor's Signature						* •	Date			
Residence: City	Traverse City		State	MI	Country	USA	Citizenship	USA		
Post Office Address			L	.1	_L	I				
Post Office Address	608 W 7th Str	eet			Ford Hough and and all the total					
City	Traverse City	State	МІ	Zip	49684	Country				
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Given Name (f	first and middle [ı	f any])				Family Nam	e or Surname			
Chad M.				Cucksey						
Inventor's Signature			···········				Date			
Residence: City	Columbus		State	ОН	Country	USA	Citizenship	USA		
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City	Columbus	State	ОН	Zip	43212	Country	USA	,,		
Name of Additional Joint	t Inventor, if any	: 0	A petit	on has be	en filed for th	ıs unsigned inve	ntor			
Given Name (f	first and middle [i	f any])				Family Nam	e or Surname			
Hamish A. I				McArthur	·					
Inventor's Signature				·			Date			
Residence: City	Mystic		State	CT	Country	USA	Citizenship	USA		
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Name of Additional Joint	t Inventor, if any	<u>": </u>	A petiti	on has bee	en filed for this	s unsigned invei	ntor	
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Inventor's	-700	P	1	11.1.) 		Date	<u> </u>
Signature	180	_	121	w/KM(o			12-27-00	
Residence: City	Columbus	·	State	ОН	Country	USA	Citizenship	USA
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Post Office Address								
City	Columbus	State	ОН	Zip	43228	Country	US	
Name of Additional Joint	Inventor, if any	': 🗆	A petiti	on has bee	en filed for this	s unsigned invei	ntor	
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Inventor's Signature				**************************************			Date	
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DECLARAT	TION FOR UTILITY OR	Attorney Docket Number	PC10433A				
	DESIGN	First Named Inventor	Harold N. Conkle				
l .	IT APPLICATION	COMPLETE IF KNOWN					
(3	37 CFR 1.63)	Application Number	09/701,760				
Declaration submitted	Declaration Submitted after Initial	Filing Date	November 30, 2000 (USA) February 25, 2000 (PCT)				
with Initial Filing	Filing (surcharge 37 CFR 1 16 (e))	Group Art Unit	Not Yet Assigned				
	required)	Examiner Name	Not Yet Assigned				

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As a below named invento	r, I hereby declare tha	t:			
My residence, post office add	dress, and citizenship a	are as stated below next to my na	ame.		
l believe I am the original, fire names are listed below) of th	st and sole inventor (if one subject matter which	only one name is listed below) or is claimed and for which a pater	r an original, first an nt is sought on the i	d joint inventor (it	f plural
METHOD FOR THE PURIF	ICATION, RECOVERY	, AND SPORULATION OF CYS	STS AND OOCYST	S	
	V	(Title of the Invention)			
the specification of which is attached hereto OR					
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I hereby state that I have rev	iewed and understand t	the contents of the above-identif	ied specification, in	cluding the claims	s, as
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		n is material to patentability as d	efined in 37 CFR 1.	56.	
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DECLARATION	Utility or Design Paten	Application
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As a named in	ventor, I hereb	y appoint the follo	wing registered	d practitions	er(s) to pr	rosecute	this applic	ation and	to transa	ict all bu	siness in th	ne Patent	
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			Registere	ed practition	ner(s) nar	me/regist	tration num	nber liste	d below				
	Name		R	egistratio Number	n			Nam	е		→	Registration Number	
Peter C. Ri				27,526		P	A. Dean	Olson				31,185	
Allen J. Spi				25,749			Mervin E					32,723	
Paul H. Gir J. Trevor L	0			28,718 28,567			√alerie M					33,688	
James T. J				30,561			Bryan C. Robert T					34,462 36,257	
Gregg C. B	enson	1		30,977			3. Timoth					39,156	
Robert F. S				31,304		P	∖lan L. K	Coller	•			37,371	
Grover F. F				31,760			Jolene W			ļ		35,428	
Karen DeB Lorraine B.		1		32,977 35.251		•	Kristina L Seth H. J		tas	1		37,864	
Garth Butte	~			36,997			Martha A		mill			32,140 31,820	
Carl J. Goddard				39,203			Gregory P. Raymer				36,647		
Raymond M. Speer				26,810			E Victor					35,492	
Jennifer A. Kispert				40,049			Roy F. W					42,208	
	Israel Nissenbaum Adrian G. Looney			27,582 41,406			Fodd M. Deborah			ŀ		37,807 44,222	
	A. David Joran			37,858			leffrey N					41,213	
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Donna R. C			······································	°-47,248			Arlene K.					37,895	
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Direct all cor	respondence		tomer Numb Bar Code Lat						OR	⊠ c	orrespond	dence address below	/
Name	Paul H. Gir	ısburg			··········				• • • • • • • • •				_
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Address	235 East 4	2nd Street, 20th	Floor										
City	New York			State		New Y	York		Zip C	ode	10017-5	755	
Country	United Stat	es Of America	Tele	phone		(212)5	573-2369		Fax		(212)57	3-1939	
believed to b	e truc, and fine or imp	further that thes prisonment or bo	e statements	were ma	de with	the kn	owledge 1	that will	ful false	stateme	nts and	mation and belief an the like so made an ze the validity of th	·e
Name of So	e or First In	ventor: A	petition has	been filed	d for this	unsign	ned inven	tor					
	Given Name	(first and middle	[if any])					Fami	ly Name	or Surr	name		
Harold N.					Conkl	e							
Inventor's Signature	21									Date			
Residence:	City	Columbus		State	Ohio	Co	ountry	USA		Citiz	enship	USA	
Post Office	Address												
Post Office Address 875 Kenridge Court													
City		Columbus	State	ОН	Zip	43	3220	Cou	ntry	USA			
Addition Addition	nal inventor	s are being name	ed on the 3 a	supplem	ental Ad	ditional	Inventor	(s) shee	et(s) PTC	/SB/02	A attache	ed hereto.	



DECLARATION

Name of Additional Join	t Inventor, if any	/: 🗆	A petit	ion has be	en filed for this	s unsigned inver	ntor				
Given Name (first and middle [i	f any])				Family Name	or Surname				
Joseph E.				Schultz							
Inventor's Signature							Date				
Residence: City	Camarillo		State	CA	Country	USA	Citizenship	USA			
Post Office Address					•			 			
Post Office Address	11675 Barranc	a Road									
City	Camarillo	State	CA	Zip	93012	Country	USA				
Name of Additional Join	t Inventor, if any	/: <u></u>	A petiti	ion has be	en filed for this	s unsigned inver	ntor				
Given Name (t	first and middle [ı	f any])				Family Name	or Surname				
Scott J.				Blonigen							
Inventor's Signature			···	, ,			Date				
Residence: City	Hilliard		Citizenship	USA							
Post Office Address			1	······································		W		<u> </u>			
Post Office Address	3325 River Na	3325 River Narrows Road									
City	Hilliard	State	ОН	Zip	43026	Country	USA				
Name of Additional Joint	Inventor, if any	: 🗆	A petiti	on has bee	en filed for this	unsigned inver	ntor				
Given Name (f	irst and middle (i	f any])				Family Name	or Surname				
Fred H.				Weber							
Inventor's Signature					* *.	· · · · · · · · · · · · · · · · · · ·	Date				
Residence: City	Terre Haute		State	IN	Country	USA	Citizenship	USA			
Post Office Address				- 							
Post Office Address	159 Phoenix C	ourt									
City	Terre Haute	State	IN	Zip	47803	Country	USA				
Name of Additional Joint	Inventor, if any	: 🗆	A petiti	on has bee	en filed for this	unsigned inven	itor				
Given Name (f	irst and middle [i	f any])				Family Name	or Surname	THE TRANSPORT			
David R.				Kilanowsk	(i						
Inventor's Signature							Date				
Residence: City	Dublin		State	ОН	Country	USA	Citizenship	USA			
Post Office Address				<u> </u>							
Post Office Address	5783 Rushwoo	d Drive									
City	Dublin	State	ОН	Zip	43017	Country					
											

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DECLARATION

Name of Additional Join	t Inventor, if any	/: <u> </u>	A petit	ion has be	en filed for thi	s unsigned inve	ntor				
Given Name (first and middle [if any])				Family Name	e or Surname				
Bruce				Monzyk							
Inventor's Signature							Date				
Residence: City	Delaware		State	ОН	Country	USA	Citizenship	USA			
Post Office Address											
Post Office Address	7460 Blaney R	load									
City	Delaware	State	ОН	Zip	43015	Country	USA				
Name of Additional Join	t Inventor, if any	/: <u> </u>	A petit	ion has be	en filed for thi	s unsigned inve	ntor				
Given Name (first and middle [i	f any])				Family Name	e or Surname				
Timothy M.				Werner							
Inventor's Signature							Date	<u> </u>			
Residence: City	Traverse City		State	Mi	Country	USA	Citizenship	USA			
Post Office Address			-l		······································	I		L			
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Given Name (f	first and middle [ı	fany])				Family Name	or Surname				
Chad M.				Cucksey							
Inventor's Signature			 -1				Date				
Residence: City	Columbus		State	ОН	Country	USA	Citizenship	USA			
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Post Office Address	1704 West 3rd	Avenue									
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Hamish A. I.			1	McArthur							
Inventor's Signature	H.K.	.9					Date	18/01			
Residence: City	Mystic		State	€T	Country	USA	Citizenship	JUSA J.N.			
Post Office Address			· · · · · · · · · · · · · · · · · · ·	····	<u> </u>			H.M.			
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DECLARATION

ADDITIONAL INVENTOR(S) Supplemental Sheet

Name of Additional Joint Inventor, if any:				tion has been filed for this unsigned inventor				
Given Name (first and middle [if any])				Family Name or Surname				
Ted L.				Tewksbury				
Inventor's Signature							Date	
Residence: City	Columbus		State	ОН	Country	USA	Citizenship	USA
Post Office Address	1309 Deerlick	Drive		.1		1		J
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City	Columbus State		ОН	Zip	43228	Country	Country US	
Name of Additional Joint Inventor, if any:				etition has been filed for this unsigned inventor				
Given Name (first and middle [if any])				Family Name or Surname				
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Patent and Trademark Office	US	DEPARTMENT	OF COMMERCE

DECLARATION FOR UTILITY	OR
DESIGN	
PATENT APPLICATION	
(37 CED 1 63)	

Declaration submitted with Initial Filing

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Declaration
Submitted after Initial
Filing (surcharge
37 CFR 1.16 (e))
required)

Attorney Docket Number	PC10433A				
First Named Inventor	Harold N. Conkle				
COMPLETE IF KNOWN					
Application Number	09/701,760				
Filing Date	November 30, 2000 (USA) February 25, 2000 (PCT)				
Group Art Unit	Not Yet Assigned				
Examiner Name	Not Yet Assicted				

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As a below named inventor, My residence, post office addr I believe I am the original, first names are listed below) of the METHOD FOR THE PURIFIC	CATION, RE	ECOVERY,	, AND SPORULATION	NOF CYS	TS AND OOCYSTS	Inter	Ugao.
			(Title of the Inver	ntion)		***	
the specification of which is attached hereto							
was filed on (MM/DD/)	YYYY) [02/25/2000)	as PCT I	nternational		
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i acknowledge the duty to disc I hereby claim foreign priority is certificate, or 365(a) of any Pi America, listed below and hav or of any PCT international ap Prior Foreign Application	benefits und CT internative also ident pplication ha	der 35 U.S. onal applicatified below ving a filing	C. 119(a)-(d) or 365(b ation which designate , by checking the box, g date before that of th Foreign Filing I) of any fo d at least of any foreig e applicat	reign application(s) one country other the gn application for pa ion on which priority Priority	for patent or inventant the United Stratent or inventor's vis claimed.	ates of certificate, py Attached?
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Peter C. Ric	chardson			27,526		A. De	an	Olson				31,185	
Allen J. Spi	•		į	25,749				. Brokk	-			32,723	
Paul H. Gin J. Trevor Lu	_		:	28,718				1. Fedo				33,688	
James T. Jo			i i	28,567 30,561				Zielinsl . Ronau				34,462 36,257	
Gregg C. B			Ì	30,977				hy Crea				39,156	
Robert F. S			·	31,304		Alan	L. K	Coller	-			37,371	
Grover F. F				31,760	Jolene W. Appleman			-	35,428				
Karen DeBe Lorraine B.			ļ	32,977 35,251	Kristina L. Konstas			}		37,864			
Garth Butte	•			36,997	Seth H. Jacobs Martha A. Gammill				32,140 31,820				
Carl J. God				39,203	Gregory P. Raymer				36,647				
Raymond N	•			26,810	E. Victor Donahue					35,492			
Jennifer A.				40,049				/aldron				42,208	
Israel Nisse Adrian G. L				27,582 41,406				Crissey				37,807 44,222	
A. David Jo	•			37,858	Deborah A. Martin Jeffrey N. Myers				41,213				
Lawrence C				28,587	Elsa Djuardi				į	45,963			
Gabriel L. K				40,681	Michelle A. Sherwood Arlene K. Musser			36,271					
Donna R. G				P-47,248								37,895	
			s) named on supplen		stered Pra	ctitioner Infor	mati	on sheet	PTO/SB/02	2C atta	ched hereto)	
Direct all con	respondence	to.	_Customer Numb or Bar Code La						OR [∑ c	orrespond	lence address be	low
Name	Paul H Gin	sburg											
Address	Pfizer Inc												
Address	235 East 42	2nd Street,	20th Floor										
City	New York			State		New York			Zip Co	de	10017-5	755	
Country	United Stat	es Of Amer	rica Tele	ephone		(212)573-2	369		Fax		(212)573	3-1939	
believed to b	e true, and fine or imp	further that orisonment,	made herein of r t these statements or both, under 1:	were mad	de with	the knowled	lge :	that willf	ul false s	stateme	ents and t	he like so made	are
Name of Sol	e or First In	ventor:	A petition has	been filed	for this	unsigned in	iven	itor				-	
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Harold N.					Conkle				·				
Inventor's Signature										Date			
Residence:	City	Columbi	us	State	Ohio	Countr	γ	USA		Citiz	enship	USA	***************************************

875 Kenndge Court

Columbus

ΟН

State

Zip

Additional inventors are being named on the 3 a supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto

43220

Country

USA

Post Office Address Post Office Address

City

DECLARATION

ADDITIONAL INVENTOR(S)
Supplemental Sheet

Name of Additional Joint	Inventor, if any	/:	A petit	ion has bee	en filed for thi	s unsigned inver	ntor		_	
Given Name (f	Given Name (first and middle [if any])					Family Name or Surname				
Joseph E.				Schultz					_	
Inventor's Signature							Date		_	
Residence: City	Camarillo		State	CA	Country	USA	Citizenship	USA		
Post Office Address	<u> </u>		1	<u> </u>		<u> </u>			-	
Post Office Address	11675 Barranc	a Road				*****			_	
City	Camarillo	State	CA	Zip	93012	Country	USA			
Name of Additional Joint	Inventor, if any	/: <u></u>	A petit	ion has bee	en filed for thi	s unsigned inver	ntor		_	
Given Name (f	îrst and middle [i	f any])				Family Name	or Surname			
Scott J.				Blonigen						
Inventor's Signature			•				Date		_	
Residence: City	Hilliard		State	ОН	Country	USA	Citizenship	USA		
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Post Office Address	3325 River Nar	rows Roa	d						_	
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Given Name (f	irst and middle [i	f any])			····	Family Name	or Surname			
Fred H.				Weber						
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Post Office Address	159 Phoenix C	ourt							_	
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David R.				Kilanowsł	Kİ					
Inventor's Signature							Date			
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ADDITIONAL INVENTOR(S) Supplemental Sheet

Name of Additional Joint	l Inventor, if any	,. In	A petit	ion has bee	en filed for this	s unsigned invei	ntor	
Given Name (first and middle [if any])				Family Name or Surname				
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Inventor's Signature							Date	
Residence: City	Delaware		State	ОН	Country	USA	Citizenship	USA
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Given Name (f	irst and middle [i	f any])				Family Name	or Surname	
Timothy M.				Werner				
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Chad M.				Cucksey				
Inventor's Signature	Chad	M.	Ou	chse	at-	- Wilder	Date 12/29/2000	
Residence: City	Columbus		State	ОН	country	USA	Citizenship	USA
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Name of Additional Joint Given Name (f Hamish A. I Inventor's Signature Residence: City	Inventor, if any	fany])	A petit	on has bee	en filed for this	s unsigned inver	or Surname Date	USA

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Name of Additional Joint	Inventor, if any	: Lo	A petiti	on has bee	en filed for thi	s unsigned inver	itor		
Given Name (first and middle [if any])					Family Name or Surname				
Ted L.				Tewksbur	У				
Inventor's Signature							Date		
Residence. City	Columbus		State	ОН	Country	USA	Citizenship	USA	
Post Office Address	1309 Deerlick (Drive	I	J		L.,	1	I	
Post Office Address									
City	Columbus	State	ОН	Zip	43228	Country	US		
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Approved for use through 09/30/2000. OMB 0651-0032

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DECLARAT	TON FOR UTILITY OR	Attorney Docket Number	PC10433A			
∵ V	DESIGN	First Named Inventor	Harold N. Conkle			
PATEN	IT APPLICATION	COMPLETE IF KNOWN				
(3	7 CFR 1.63)	Application Number	09/701,760			
Declaration submitted	Declaration Submitted after Initial	Filing Date	November 30, 2000 (USA) February 25, 2000 (PCT)			
with Initial Filing	Filing (surcharge 37 CFR 1.16 (e))	Group Art Unit	Not Yet Assigned			
	required)	Examiner Name	Not Yet Assigned			

	As a below named inventor	•										
	My residence, post office add	dress, and citiz	zenship a	re as stated below next to my na	ame.							
	I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:											
	METHOD FOR THE PURIFICATION, RECOVERY, AND SPORULATION OF CYSTS AND OOCYSTS											
And And And	(Title of the Invention) the specification of which ☐ is attached hereto OR											
1000	was filed on (MM/DD/YYYY) 02/25/2000 as PCT International											
of the second	Application Number PCT	/US00/0473	- 1	vas amended on DD/YYYY)		(if applicat	ole).					
	I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.											
	l acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.											
	I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.											
	Prior Foreign Application Number(s)	Count	ry	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES NO						
	☐ Additional foreign applicatio	n numbers are	e listed or	ı a supplemental priority data sh	eet PTO/SB/02B at	tached hereto						
	i hereby claim the benefit und	der 35 U.S.C.	119(e) of	any United States provisional a	pplication(s) listed t	pelow:	**************************************					
	Application Number	(s)		Filing Date (MM/DD/YYYY)								
	60/122,160		2/26/99)	numbers suppleme	Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B sheet attached hereto.						

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U.S. Parent	Application Num		or PCT Pare		•						Patent Number		
Additiona	al U.S. or PCT	Internationa	l application n	umbers are listed	on a sun	nleme	ental priority (data shee	PTO/SB/	12B att	ached here	to	
				stered practition									
and Trademark Office connected therewith Customer Number or												Place Customer lumber Bar Code Label here	
		····	∑ Re	egistered practitio	ner(s) nar	ne/reg	gistration nun	nber listed	l below				
	Name			Registration Number				Name)			Registration Number	
Peter C. Ri				27,526			A. Dean					31,185	
Allen J. Spi Paul H. Gin	9			25,749 28,718			Mervin E Valerie N		-	- 1		32,723 33.688	
J. Trevor Lu	~			28,567			Bryan C.					34,462	
James T. Jo	ones			30,561		İ	Robert T			j		36,257	
Gregg C. B				30,977		- 1	B. Timotl	hy Crea	gan	ı	39,156		
Robert F. S				31,304			Alan L. K			l		37,371	
Grover F. F				31,760			Jolene W			l		35,428	
Karen DeB				32,977 35,251			Kristina L Seth H. J		as			37,864 32,140	
Garth Butte	-			36,997			Martha A		nill	1		31,820	
Carl J. God				39,203			Gregory					36,647	
Raymond N	1. Speer			26,810			• .	Victor Donahue			35,492		
Jennifer A.				40,049		İ	Roy F. Waldron					42.208	
Israel Nisse				27,582	Todd M. Crissey					37.807			
Adrian G. L A. David Jo	•			41,406 37,858	Deborah A. Martin Jeffrey N. Myers			ı	44,222 41,213				
Lawrence C				28,587								45,963	
Gabriel L. K				40,681		Michelle A. Sherwood			- 1	36,271			
Donna R. G	Grossu			P-47,248	P-47,248			Arlene K. Musser			37,895		
Addition	nat registered p	oractitioner(s	s) named on s	upplemental Reg	stered Pr	actition	ner Informati	on sheet	PTO/SB/0:	2C atta	ched hereto)	
Direct all cor	respondence	e to:	Customer or Bar Co						OR	⊠ c	orrespond	lence address below	
Name	Paul H. Gin	sburg											
Address	Pfizer Inc												
Address	235 East 42	2nd Street,	20th Floor										
City	New York			State		Nev	w York		Zip Co	de	10017-5	755	
Country	United State	es Of Ame	rica	Telephone		(212	2)573-2369)	Fax		(212)573	3-1939	
believed to b	e true, and r fine or imp	further tha prisonment,	t these state	ements were ma	ade with	the	knowledge	that willf	ul false	stateme	ents and t	mation and belief are he like so made are ze the validity of the	
Name of So	le or First In	ventor:	A petition	n has been file	d for this	s unsi	gned inven	ntor					
(Given Name	(first and r	niddle [ıf any])				Famı	ly Name	or Sur	name		
Harold N.					Conkl	le							
Inventor's Signature								•		Date	,		
Residence:	City	Columb	us	State	Ohio	Ohio Country USA				Citizenship		USA	

875 Kenridge Court

Columbus

ОН

Zip

Additional inventors are being named on the 3 a supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

State

43220

Country

USA

Post Office Address Post Office Address

City

DECLARATION

ADDITIONAL INVENTOR(S) Supplemental Sheet

Name of Additional Joint	t Inventor, if any	':	A petit	ion has be	en filed for thi	is unsigned invei	ntor				
Given Name (1	first and middle [i	f any])		Family Name or Surname							
Joseph E.	· · · · · · · · · · · · · · · · · · ·			Schultz							
Inventor's Signature							Date				
Residence: City	Camarillo		State	CA	Country	USA	Citizenship				
Post Office Address					<u>'</u>						
Post Office Address	11675 Barranc	a Road			77 - 1-11 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111						
City	Camarillo	State	CA	Zip	93012	Country	USA				
Name of Additional Joint	t Inventor, if any	<u>": </u>	A petit	ion has be	en filed for thi	is unsigned inve	ntor				
Given Name (i	first and middle [i	f any])		Family Name or Surname							
Scott J.				Blonigen							
Inventor's Signature			· · · · · · · · · · · · · · · · · · ·				Date				
Residence: City	Hilliard	State	ОН	Country	USA	Citizenship	USA				
Post Office Address			•								
Post Office Address	3325 River Nai	rows Roa	d								
City	Hilliard	State	ОН	Zip	43026	Country	USA				
Name of Additional Joint	t Inventor, if any	': D	A petit	ion has be	en filed for the	ıs unsıgned inve	ntor				
Given Name (f	first and middle [i	f any])				Family Name	e or Surname				
Fred H.				Weber							
Inventor's Signature							Date				
Residence: City	Terre Haute		State	IN	Country	USA	Citizenship	USA			
Post Office Address				1	·!		,	<u> </u>			
Post Office Address	159 Phoenix C	ourt									
City	Terre Haute	State	IN	Zip	47803	Country	USA				
Name of Additional Join	t Inventor, if any	': 🗆	A petit	ion has be	en filed for thi	is unsigned inve	ntor				
Given Name (i	first and middle [i	f any])				Family Name	e or Surname				
David R.				Kilanows	ki						
Inventor's Signature			l				Date				
Residence: City	Dublin		State	ОН	Country	USA	Citizenship	USA			
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Post Office Address	:		. 								
Post Office Address Post Office Address	5783 Rushwoo	od Drive									
	5783 Rushwoo	d Drive	ОН	Zip	43017	Country					

DECLARATION

ADDITIONAL INVENTOR(S) Supplemental Sheet

Name of Additional Joint	t Inventor, if any	: Тп	A petiti	on has bee	en filed for this	s unsigned inver	ntor				
Given Name (f	first and middle (if	f anvl)	· · · · · · · · · · · · · · · · · · ·	Family Name or Surname							
Bruce				Monzyk							
Inventor's Signature				**************************************			Date				
Residence: City	Delaware		State	ОН	Country	USA	Citizenship	USA			
Post Office Address			,L.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<u> </u>	I			L			
Post Office Address	7460 Blaney R	oad									
City	Delaware	State	ОН	Zip	43015	Country	ŲSA				
Name of Additional Joint	Inventor, if any	: 🔲	A petiti	on has bee	en filed for this	s unsigned inver	ntor				
Given Name (f	irst and middle [it	f any])		Family Name or Surname							
Timothy M.				Werner							
Inventor's Signature	Limoth	7	n. Ver	~	VIII		Date	12/20/00			
Residence: City	Traverse City State			MI	Country	USA	Citizenship	USA			
Post Office Address				····							
Post Office Address	608 W. 7th Stre	eet									
City	Traverse City	State	MI	Zip	49684	Country					
Name of Additional Joint	t Inventor, if any	: 0	A petiti	on has bee	en filed for this	s unsigned inver	ntor				
Given Name (f	first and middle [it	f any])				Family Name	e or Surname				
Chad M.				Cucksey							
Inventor's Signature							Date				
Residence: City	Columbus		State	ОН	Country	USA	Citizenship	USA			
Post Office Address								, , , , , , , , , , , , , , , , , , , ,			
Post Office Address	1704 West 3rd	Avenue									
City	Columbus	State	ОН	Zip	43212	Country	USA				
Name of Additional Joint	t Inventor, if any	:	A petiti	on has bee	en filed for this	s unsigned inver	ntor				
Given Name (f	first and middle [in	f any])				Family Name	e or Surname				
Hamish A. I	· · · · · · · · · · · · · · · · · · ·			McArthur		· · · · · · · · · · · · · · · · · · ·					
Inventor's Signature						····	Date				
Residence: City	Mystic		State	CT Country USA			Citizenship	USA			
Post Office Address					·						
Post Office Address	202 Library Str	eet		·			**************************************				
City	Mystic	State	СТ	Zip	06355	Country	USA				

DECLARATION

ADDITIONAL INVENTOR(S) Supplemental Sheet

Name of Additional Join	t Inventor, if any	/:] A petit	tion has been filed for this unsigned inventor							
Given Name (first and middle [i	f any])		Family Name or Surname							
Ted L.				Tewksbury							
Inventor's Signature			· · · · · · · · · · · · · · · · · · ·				Date				
Residence: City	Columbus		State	ОН	Country	USA	Citizenship	USA			
Post Office Address	1309 Deerlick	Drive		<u>- t</u>							
Post Office Address				1. f. 11			1.4.1 M				
City	Columbus	State	ОН	Zip	43228	Country	US				
Name of Additional Join	·: [] A petit	ion has be	en filed for thi	s unsigned inve	ntor					
Given Name (first and middle [i	f any])		Family Name or Surname							
Inventor's Signature							Date				
Residence, City		State			Country		Citizenship				
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City		State		Zip		Country					
Name of Additional Joint	t Inventor, if any	·: [] A petit	ion has be	en filed for thi	s unsigned inve	ntor				
Given Name (t	first and middle [i	fany])				Family Name	e or Surname				
Inventor's Signature			L		· · · · · · · · · · · · · · · · · · ·		Date				
Residence: City			State		Country		Citizenship				
Post Office Address											
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City		State		Zip		Country					
Name of Additional Joint	t Inventor, if any	: [] A petit	ion has be	en filed for thi	s unsigned inve	ntor				
Given Name (f	first and middle [i	f any])				Family Name	e or Surname				
Inventor's Signature		T-1/					Date				
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DECLARAT	ION FOR UTILITY OR	Attorney Docket Number	PC10433A			
	DESIGN	First Named Inventor	Harold N. Conkle			
PATEN	IT APPLICATION	COMPLETE IF KNOWN				
(3	7 CFR 1.63)	Application Number	09/701,760			
Declaration submitted	Declaration Submitted after Initial	Filing Date	November 30, 2000 (USA) February 25, 2000 (PCT)			
with Initial Filing	Filing (surcharge 37 CFR 1.16 (e))	Group Art Unit	Not Yet Assigned			

	required)	Examiner Name		Not Yet Assigned							
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As a below named inventor, I hereby declare that:											
My residence, post office address, and citizenship are as stated below next to my name.											
I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:											
METHOD FOR THE PURIF	ICATION, RECOVERY	, AND SPORULATION OF CYS	STS AND OOCYS	ΓS							
the specification of which		(Title of the Invention)									
is attached hereto											
OR											
	(YYYY) 02/25/2000	as PCT	International								
Application Number PCT	,	vas amended on		(if applicab	ole).						
hereby state that I have revi		DD/YYYY) he contents of the above-identi	fied specification i		3 28						
amended by any amendmen			nod opodniodion, i	Totaling and ordine	5, 40						
Lacknowledge the duty to dis	sclose information which	n is material to patentability as o	lefined in 37 CER	1 56							
		C. 119(a)-(d) or 365(b) of any for a stion which designated at least									
America, listed below and ha	ve also identified below	, by checking the box, any forei	gn application for	patent or inventor's	certificate,						
	pplication having a filing	date before that of the applica	tion on which prior	ty is claimed.							
Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed		Certified Copy Attached? YES NO						
Trainio ((o)	Joanny	(MM/DD/1111)	- Not Glaimed	163	NO						
C Address of C											
		a supplemental priority data sh									
		any United States provisional a	pplication(s) listed	below							
Application Number		iling Date (MM/DD/YYYY)									
60/122,160	2/26/99	i.		Additional provisional application numbers are listed on a							
			1	supplemental priority data sheet							
			PTO/SB	02B sheet attache	ed hereto.						
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DECLARATION	Utility	or Design	Patent	Application
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I hereby claim the benefit under 35 U S C 120 of any United States application(s), or 365(c) of any PCT international application designating the

United States	or PCT Inte	ernational ap rial to pater	pplication in t itability as de	he ma efined	nner provi in 37 US	ided by	the fu	rst paragrap	h of 35	USC	112. l a	acknowledo	disclosed in the p ge the duty to discl of the prior applica	ose
U.S. Parent		Number onber	or PCT Pare	nt	Parent Filing Date (MM/DD/YYYY)				Parent Patent Number (if applicable)					
														
	al U.S. or PCT													
As a named in and Trademar			-		practitione Number	er(s) to pr	rosecu	te this applic	ation and	to transa	ect all bu	siness in th	he Patent Place Customer	1
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	Name		Ke				me/reg	stration nun		-,			Desilet esti	
	Name				egistratio Number	n			Name	9		7	Registration Number	
Peter C. Ri					27,526			A. Dean	Olson				31,185	
Allen J. Sp	•				25,749			Mervin E					32,723	
Paul H. Gir J. Trevor L					28,718		1	Valerie M			1		33,688	
James T. J					28,567 30,561			Bryan C. Robert T			- 1		34,462 36,257	
Gregg C. B					30,977			B. Timoth					39,156	
Robert F. S					31,304		l	Alan L. K	Coller	-			37,371	
Grover F. F					31,760			Jolene W					35,428	
Karen DeB Lorraine B.					32,977		1	Kristina L		tas			37,864	
Garth Butte	9			35,251 36,997			Seth H. Jacobs Martha A. Gammill			ļ	32,140 31,820			
Carl J. Goo	ldard				39,203		-	Gregory			1	36,647		
Raymond N					26,810		ļ	E. Victor			1	35,492		
Jennifer A.	1				40,049			Roy F. W			1	42,208		
Israel Nisse Adrian G. L					27,582 41,406			Todd M. Deborah	,		l		37,807 44,222	
A. David Jo	•				37,858			Jeffrey N					41,213	
Lawrence (C. Akers				28,587		İ	Elsa Djua			i		45,963	
Gabriel L. h					40,681			Michelle	-				36,271	
Donna R. C		 						Arlene K			į		37,895	
	nal registered) named on su	upplem	ental Regi	stered Pr	ractition	ner Informati	on sheet	PTO/SB/0	02C attac	ched heret	0	
Direct all cor	respondence	e to:	Customer or Bar Cod		i i			or 🖂		⊠ c	Correspondence address below			
Name	Paul H. Gir	nsburg												^
Address	Pfizer Inc													
Address		2nd Street,	20th Floor				,			_		*		
City	New York	too Of Amor			State		1	v York		Zip C	ode	10017-5		
Country	United Stat	tes Of Amei	ıca	reie	phone		(212	2)573-2369		Fax		(212)57	3-1939	
believed to b	be true, and / fine or im	further that prisonment,	these state	ments	were ma	de with	the I	knowledge	that willt	ful false	stateme	ents and	rmation and belief the like so made ize the validity of	are
Name of So	le or First Ir	ventor:	A petitio	n has	been file	d for this	s unsi	gned inven	tor			W.I		
	Given Name	(first and n	niddle [if any])					Fami	ly Name	or Sur	name		
Harold N.						Conkl	le							
Inventor's Signature											Date			
Residence:	City	Columbi	ıs		State	Ohio) (Country	USA		Citiz	enship	USA	
Post Office														
Post Office	Address		ridge Cour							-				
City		Columbi		ate	ОН	Zip		43220	Cou		USA			
	onal inventor	s are being	named on the	he <u>3</u> a	supplem	ental Ac	ddition	nal Inventor	(s) shee	et(s) PTC	D/SB/02	A attache	ed hereto.	

DECLARATION

Name of Additional Join	t Inventor, if any	':	A petit	ion has be	en filed for thi	s unsigned inver	ntor					
Given Name (first and middle [i	f any])				Family Name	or Surname					
Joseph E.	\sim	\bigcirc 1	Λ,	Senultz								
Inventor's Signature	Do	- Dh	ut				Date 12-30-00					
Residence: City	Carnarillo		State	CA	Country	USA	Citizenship	USA				
Post Office Address												
Post Office Address	11675 Barranc	a Road										
City	Camarillo	State	CA	Zip	93012	Country	USA					
Name of Additional Join	Inventor, if any	: 🗆	A petit	ion has be	en filed for thi	s unsigned inver	ntor					
Given Name (I	irst and middle [i	f any])				Family Name	or Surname					
Scott J.				Blonigen								
Inventor's Signature							Date					
Residence: City	Hilliard		State	ОН	Country	USA	Citizenship	USA				
Post Office Address						<u> </u>						
Post Office Address	3325 River Nar	3325 River Narrows Road										
City	Hilliard	State	ОН	Zip	43026	Country	USA					
Name of Additional Joint	Inventor, if any	: 🗆	A petiti	ion has be	en filed for this	s unsigned inver	ntor					
Given Name (f	irst and middle [i	f any])				Family Name	or Surname					
Fred H.				Weber								
Inventor's Signature		,					Date					
Residence: City	Terre Haute		State	IN	Country	USA	Citizenship	USA				
Post Office Address		1				· · · · · · · · · · · · · · · · · · ·						
Post Office Address	159 Phoenix C	ourt										
City	Terre Haute	State	IN	Zip	47803	Country	USA					
Name of Additional Joint	Inventor, if any	: 0	A petiti	ion has bee	en filed for this	s unsigned inver	ntor					
Given Name (f	irst and middle [i	f any])				Family Name	or Surname					
David R.				Kilanowsł	ki							
Inventor's Signature							Date	TOTAL III				
Residence: City	Dublin		State	ОН	Country	USA	Citizenship	USA				
Post Office Address		· · · · · · · · · · · · · · · · · · ·	1					l				
Post Office Address	5783 Rushwoo	d Drive										
City	Dublin	State	ОН	Zip	43017	Country		M-Ind				
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DECLARATION

Name of Additional Join	t Inventor, if any	/:	A peti	ion has be	en filed for thi	s unsigned inve	ntor				
Given Name (first and middle [i	f any])				Family Name	e or Surname				
Bruce				Monzyk							
Inventor's Signature							Date				
Residence: City	Delaware		State	ОН	Country	USA	Citizenship	USA			
Post Office Address					1	1					
Post Office Address	7460 Blaney R	oad									
City	Delaware	State	ОН	Zip	43015	Country	USA				
Name of Additional Join	t Inventor, if any	':	A petit	ion has be	en filed for thi	s unsigned inve	ntor				
Given Name (i	first and middle [i	f any])				Family Name	e or Surname				
Timothy M.				Werner							
Inventor's Signature			·············				Date				
Residence: City	Traverse City		State	MI	Country	USA	Citizenship	USA			
Post Office Address											
Post Office Address	608 W. 7th Str	608 W. 7th Street									
City	Traverse City	State	MI	Zip	49684	Country					
Name of Additional Joint	t Inventor, if any	: 0	A petit	ion has bee	en filed for thi	s unsigned inve	ntor				
Given Name (f	first and middle [i	f any])				Family Name	e or Surname				
Chad M.				Cucksey							
Inventor's Signature							Date				
Residence: City	Columbus		State	ОН	Country	USA	Citizenship	USA			
Post Office Address											
Post Office Address	1704 West 3rd	Avenue									
City	Columbus	State	ОН	Zip	43212	Country	USA				
Name of Additional Joint	Inventor, if any	: 🗀	A petit	ion has bee	en filed for this	s unsigned inve	ntor				
Given Name (f	irst and middle [i	f any])				Family Name	or Surname				
Hamish A. I.				McArthur	,						
Inventor's Signature							Date				
Residence: City	Mystic		State	СТ	Country	USA	Citizenship	USA			
Post Office Address			·		Ae			I			
Post Office Address	202 Library Str	eet									
City	Mystic	State	СТ	Zip	06355	Country	USA				
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Name of Additional Join	t Inventor, if any	/:	A petit	on has be	en filed for thi	s unsigned inver	ntor	
Given Name (t	first and middle [i	f any])				Family Name	or Surname	
Ted L.				Tewksbu	ry			
Inventor's Signature						Date		
Residence: City	Columbus		State	USA	Citizenship	USA		
Post Office Address	1309 Deerlick	Drive		· · · · · · · · · · · · · · · · · · ·		<u> </u>	.1	
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City	Columbus	State	ОН	Zip	43228	Country	US	
Name of Additional Joint	Inventor, if any	<u>': □</u>	A petiti	on has be	en filed for thi	s unsigned inver	ntor	
Given Name (f	first and middle [ı	f any])				Family Name	or Surname	
Inventor's Signature		4.00					Date	
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Patent and Trademark Office. U.S.	DEPARTMENT OF COMMERCE

DECLARAT	ION FOR UTILITY OR	Attorney Docket Number	PC10433A			
	DESIGN	First Named Inventor	Harold N. Conkle			
PATEN	T APPLICATION -	COMPLETE IF KNOWN				
(3	7 CFR 1.63)	Application Number	09/701,760			
□ Declaration submitted	Declaration Submitted after Initial	Filing Date	November 30, 2000 (USA) February 25, 2000 (PCT)			
with Initial Filing	Filing (surcharge 37 CFR 1.16 (e))	Group Art Unit	Not Yet Assigned			
	required)	Examiner Name	Not Yet Assigned			

As a below named invento	r, I hereby dec	lare tha	it:				
My residence, post office ad	dress, and citiz	enship a	are as stated below next	to my na	ame.		
I believe I am the original, fir names are listed below) of the	st and sole invene subject matte	entor (if o	only one name is listed is claimed and for whic	oelow) or h a paten	an original, first an it is sought on the i	d joint inventor (i nvention entitled.	f plural
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			(Title of the Invent	ion)			
the specification of which is attached hereto OR			,	- ,			
was filed on (MM/DD	/YYYY) <u>02</u>	2/25/200	0	as PCT I	nternational		
Application Number PCT I hereby state that I have rev amended by any amendmen I acknowledge the duty to dis	t specifically re	(MM/ erstand to ferred to	above.			•	,
I hereby claim foreign priority certificate, or 365(a) of any I America, listed below and ha or of any PCT international a	PCT internation ve also identific	al applic ed below	cation which designated v. by checking the box. a	at least o	one country other than application for pa	nan the United St	ates of
Prior Foreign Application Number(s)	Countr	У	Foreign Filing D (MM/DD/YYYY		Priority Not Claimed	Certified Co YES	ppy Attached? NO
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Additional foreign application					··· · · · · · · · · · · · · · · · · ·		
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Application Number 60/122,160	(s)		iling Date (MM/DD/YY				

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Addition	al U.S. or PCT International appl	ication num	bers are listed o	n a sup	plemental pric	onty data shee	t PTO/SB/02B at	tached hereto	
	ventor, I hereby appoint the follo			(s) to pr	rosecute this a	pplication and	to transact all b		
and Trademar	k Office connected therewith		omer Number or					Nun	nce Customer nber Bar Code Label here
		Regis	stered practitione	er(s) nar	me/registration	number listed	d below		
	Name		Registration Number) 		Name	•		gistration Number
Peter C. Ri			27,526			an Olson		li .	31,185
Allen J. Spi Paul H. Gir			25,749 28,718			in E. Brokk			32,723
J. Trevor Li	Q		28,567			rie M. Fedor n C. Zielins:			33,688 34,462
James T. J			30,561			rt T. Ronau			36,257
Gregg C. B			30,977		1	nothy Crea		i e	39,156
Robert F. S			31,304			L. Koller			37,371
Grover F. F Karen DeB	*****		31,760			e W. Apple			35,428
Lorraine B.			32,977 35,251			na L. Konst H. Jacobs	ias		37,864
Garth Butte			36,997			n. Jacobs na A. Gamn	nill		32,140 31,820
Carl J. God			39,203			ory P. Rayr			36,647
Raymond N			26,810			ctor Donahi			35,492
Jennifer A.	•		40,049			Waldron			12,208
Israel Nisse Adrian G. L			27,582			M. Crissey			37,807
A. David Jo	,		41,406 37,858			rah A. Marl y N. Myers			14,222 11,213
Lawrence C	· -···		28,587			Diuardi			15,963
Gabriel L. k	(leiman		40,681			elle A. Sher	wood		36,271
Donna R. G	Brossu		P-47,248		Arlen	e K. Musse	er		37,895
Addition	nal registered practitioner(s) nan	ned on supp	lemental Registe	ered Pra	actitioner Infor	mation sheet f	PTO/SB/02C atta	ched hereto	
Direct all cor		stomer Nu Bar Code					OR 🛛 🤆	Corresponden	ce address below
Name	Paul H. Ginsburg								
Address	Pfizer Inc								
Address	235 East 42nd Street, 20th	Floor							-
City	New York	 	State		New York		Zip Code	10017-5755	5
Country	United States Of America	Т	elephone		(212)573-2	369	Fax	(212)573-1	
punishable by	are that all statements madie true, and further that their fine or imprisonment, or bany patent issued thereon	se stateme	ents were made	e with	the knowled	lge that willfa	ul false statem	ents and the	like so made are
Name of Sol	e or First Inventor:	A petition h	nas been filed	for this	unsigned in	ventor		-	
(Given Name (first and middle	[if any])				Famil	y Name or Su	name	
II LIAI							····		

Harold N. Conkle Inventor's Date Signature Residence: City Columbus State Ohio Country USA Citizenship USA Post Office Address Post Office Address 875 Kenridge Court City ОН State Zip 43220 Columbus Country USA Additional inventors are being named on the 3 a supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.



ADDITIONAL INVENTOR(S) Supplemental Sheet

Name of Additional Join	t Inventor, if any	/:	A petit	ion has be	en filed for thi	s unsigned inve	ntor				
Given Name (i	first and middle [f any])					e or Surname				
Joseph E.				Schultz							
Inventor's Signature						*****	Date				
Residence: City	Camarillo		State	CA	Country	USA	Citizenship	USA			
Post Office Address			-L		· · · · · · · · · · · · · · · · · · ·	VIOLE IN THE STATE OF THE STATE					
Post Office Address	11675 Barrand	a Road					***				
City	Camarillo	State	CA	Zip	93012	Country	USA				
Name of Additional Joint	Inventor, if any	': <u> </u>	A petit	ion has be	en filed for this	s unsigned inve	ntor				
Given Name (f	irst and middle [i	f any])		**********		Family Name	e or Surname				
Scott J.	a			Blonigen							
Inventor's Signature	Les	4 B	6:				12/28/00				
Residence: City	Hilliard 0		State	ОН	Country	USA	Citizenship	USA			
Post Office Address				<u> </u>							
Post Office Address	3325 River Na	3325 River Narrows Road									
City	Hilliard	State	ОН	Zip	43026	Country	USA				
Name of Additional Joint	Inventor, if any	: 🗆	A petiti	on has bee	en filed for this	s unsigned inve	ntor				
Given Name (f	irst and middle [i	f any])				Family Name	or Surname				
Fred H.				Weber							
Inventor's Signature							Date				
Residence: City	Terre Haute		State	IN	Country	USA	Citizenship	USA			
Post Office Address			·	1	IL			L			
Post Office Address	159 Phoenix C	ourt									
City	Terre Haute	State	IN	Zip	47803	Country	USA				
Name of Additional Joint	Inventor, if any	: 0	A petiti	on has bee	en filed for this	s unsigned inver	ntor				
Given Name (f	irst and middle [i	f any])				Family Name					
David R.				Kilanowsk	(i						
Inventor's Signature							Date				
Residence: City	Dublin		State	ОН	Country	USA	Citizenship	USA			
Post Office Address					I		1	L			
Post Office Address	5783 Rushwoo	d Drive	~ 	** ** · · · · · · · · · · · · · · · · ·							
City	Dublin	State	ОН	Zip	43017	Country					
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DECLARATION

Name of Additional Join	nt Inventor, if an	y: 🗆	A peti	tion has be	en filed for thi	is unsigned inve	entor				
Given Name ((first and middle [if any])				Family Nam	ne or Surname				
Bruce				Monzyk							
Inventor's Signature							Date				
Residence: City	Delaware		State	ОН	Country	USA	Citizenship	USA			
Post Office Address											
Post Office Address	7460 Blaney F	Road									
City	Delaware	State	ОН	Zip	43015	Country	USA				
Name of Additional Join	t Inventor, if any	y: 🗆	A peti	tion has be	en filed for thi	s unsigned inve	entor				
	first and middle [if any])				Family Nam	e or Surname				
Timothy M.				Werner							
Inventor's Signature							Date				
Residence: City	Traverse City		State	MI	Country	USA	Citizenship	USA			
Post Office Address							<u> </u>	1			
Post Office Address	608 W. 7th Str	608 W. 7th Street									
City	Traverse City	Traverse City State MI Zip 49684 Country									
Name of Additional Join	t Inventor, if any	/:	A petit	ion has be	en filed for thi	s unsigned inve	entor				
Given Name (first and middle [i	f any])	•			Family Nam	e or Surname	· · · · · · · · · · · · · · · · · · ·			
Chad M.				Cucksey							
Inventor's Signature					And a second		Date				
Residence: City	Columbus		State	ОН	Country	USA	Citizenship	USA			
Post Office Address			<u> </u>	. I							
Post Office Address	1704 West 3rd	Avenue			· · · · · · · · · · · · · · · · · · ·						
City	Columbus	State	ОН	Zip	43212	Country	USA				
Name of Additional Joint	t Inventor, if any	':	A petit	ion has be	en filed for this	s unsigned inve	ntor				
Given Name (f	first and middle [i	f any])				Family Name	e or Surname				
Hamish A. I				McArthur							
Inventor's Signature							Date				
Residence: City	Mystic		State	CT	Country	USA	Citizenship	USA			
Post Office Address								t			
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City	Mystic	State	СТ	Zip	06355	Country	USA				
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DECLARATION

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Post Office Address City Columbus State OH Zip 43228 Country US Name of Additional Joint Inventor, if any: Given Name (first and middle [if any]) Inventor's Signature Residence: City State Country State Country Country Date Citizenship Country A petition has been filed for this unsigned inventor Family Name or Sumame Citizenship Country Citizenship A petition has been filed for this unsigned inventor Family Name or Sumame City Country Citizenship A petition has been filed for this unsigned inventor City State Country Country Name of Additional Joint Inventor, if any: Given Name (first and middle [if any]) Family Name or Sumame Family Name or Sumame Country Citizenship Post Office Address City State Country Citizenship A petition has been filed for this unsigned inventor Country Citizenship Family Name or Sumame City State Country Citizenship A petition has been filed for this unsigned inventor Family Name or Sumame City State Country Citizenship A petition has been filed for this unsigned inventor Family Name or Sumame Family Name or Sumame Inventor's Signature City State Country Citizenship Country Citizenship Post Office Address Country Citizenship Country Citizenship	Signature							Date		
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DECLARAT	ION FOR UTILITY OR	Attorney Docket Number	PC10433A			
	DESIGN	First Named Inventor	Harold N. Conkle			
PATEN	T APPLICATION	COMPLETE IF KNOWN				
(3	7 CFR 1.63)	Application Number	09/701,760			
Declaration submitted	Declaration Submitted after Initial	Filing Date	November 30, 2000 (USA) February 25, 2000 (PCT)			
with Initial Filing (surcharge Filing 37 CFR 1.16 (e))		Group Art Unit	Not Yet Assigned			
	required)	Examiner Name	Not Yet Assigned			

As a below named invento							
My residence, post office ad	ldress, and	citizenship a	are as stated below next	to my na	me.		
believe I am the original, find names are listed below) of the	st and sole he subject m	inventor (if o atter which	only one name is listed be is claimed and for which	elow) or ı a paten	an original, first an t is sought on the i	d joint inventor (it	plural
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United States United States information w	s of America s or PCT Int /hich is mate	nder 35 U S C 120 a, listed below ar ernational applica rrial to patentabili ernational filing dat	nd, insofar a ition in the r ity as define	as the subje manner provi d in 37 U.S	ct matter	of each o	f the clai	ms of this	applicat	ion is no	t disclosed in the	ierlnea
U.S. Parent		n Number or P0 mber	T Parent	Parent Filing Date (MM/DD/YYYY)			Pa	Parent Patent Number (if applicable)				
Addition	al U.S. or PC	T International app	lication numb	ers are listed	on a supp	lemental pric	rity data s	heet PTO/SB	/02B at	tached her	eto	
As a named in	ventor, I here	by appoint the follo ected therewith	ed practitione ner Number r	er(s) to pro	osecute this a	pplication	and to transa	ict all bu	isiness in t	he Patent Place Customer Number Bar Code Label here		
			Registe	ered practition	ner(s) nam	ne/registration	number l	sted below		L	Labermere	
	Name		J	Registratio Number	n		Na	ame			Registration Number	***
Peter C. Ri				27,526			an Olso				31,185	
Allen J. Spi Paul H. Gır			ĺ	25,749 28,718			n E. Bro	okke edowich			32,723 33,688	
J. Trevor Li				28,567		I I	C. Ziel				34,462	
James T. J			ĺ	30,561			rt T. Ro		l		36,257	
Gregg C. B Robert F. S				30,977			nothy C				39,156	
Grover F. F				31,304 31,760			L. Koller	r opleman			37,371 35,428	
Karen DeB				32,977		Kristi	na L. Ko	nstas			37,864	
Lorraine B.	_			35,251			H. Jacol		İ		32,140	
Garth Butte				36,997		Martha A. Gammill				31,820		
Carl J. God Raymond N				39,203			Gregory P. Raymer			36,647		
Jennifer A.				26,810 40,049			E. Victor Donahue Roy F. Waldron			35,492 42,208		
Israel Nisse				27,582			M. Cris				42,206 37,807	
Adrian G. L	.ooney			41,406			rah A. M				44,222	
A. David Jo			l	37,858			y N. My	ers			41,213	
Lawrence C Gabriel L. K				28,587			Djuardi	f= t			45,963	
Donna R. G				40,681 P-47,248			elle A. S e K. Mu:	herwood			36,271 37,895	
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Name	Paul H Gi	nsburg										
Address	Pfizer Inc											
Address	235 East 4	2nd Street, 20th	Floor									
City	New York			State		New York		Zip Co	ode	10017-5	5755	
Country	United Sta	tes Of America	Te	lephone		(212)573-2	369	Fax		(212)57	3-1939	
pelieved to b	e true, and / fine or im	statements made further that thes prisonment, or bued thereon	se statement	ts were mad	de with t	the knowled	ge that v	willful false	stateme	ante and	the like so mad	0 250
Name of Sol	le or First Ir	nventor:	A petition ha	s been filed	for this	unsigned in	ventor					
(Given Name	(first and middle	≀ [if any])				Fa	amily Name	or Sur	name		
Harold N.		1			Conkle							
Inventor's Signature									Date			
Residence:	City	Columbus		Stata	Ohio	Countr		Δ	C:A:-	I- :		
Post Office		Columbus		State	Ohio	Countr	y US	<u> </u>	CITIZ	enship	USA	
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City		875 Kenridge Columbus	State	ОН	Zip	43220		auntr:	110 ^			
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DECLARATION

Name of Additional Join	t Inventor, if an	y: [] A petit	ion has be	en filed for th	is unsigned inve	entor		
Given Name (first and middle [if any])				Family Nam	e or Surname		
Joseph E.				Schultz					
Inventor's Signature							Date		
Residence: City	Camarillo		State	CA	Country	USA	Citizenship	USA	
Post Office Address				- 1	-J			J	
Post Office Address	11675 Barrand	a Road						***************************************	
City	Camarillo	State	CA	Zip	93012	Country	USA		
Name of Additional Join	t Inventor, if an	/:] A petit	ion has be	en filed for thi	is unsigned inve	ntor		
Given Name (first and middle [f any])				Family Nam	e or Surname		-
Scott J.				Blonigen					
Inventor's Signature							Date		
Residence: City	Hilliard		State	ОН	Country	USA	Citizenship	USA	
Post Office Address					- I	I		1	
Post Office Address	3325 River Na	rrows Roa	ad						
City	Hılliard	State	ОН	Zip	43026	Country	USA		
Name of Additional Join	t Inventor, if any	/:	A petiti	on has be	en filed for thi	s unsigned invei	ntor		
Given Name (first and middle [i	f any])		·····		Family Name	e or Surname		
Fred H.				Weber					
Inventor's Signature			<u></u>				Date		
Residence: City	Terre Haute		State	IN	Country	USA	Citizenship	USA	
Post Office Address					· · · · · · · · · · · · · · · · · · ·	······	- 1		***************************************
Post Office Address	159 Phoenix C	ourt							**
City	Terre Haute	State	IN	Zip	47803	Country	USA		
Name of Additional Joint	Inventor, if any	:	A petiti	on has be	en filed for thi	s unsigned inver	ntor		
Given Name (f	îrst and mıddle (i	f any])					e or Surname		
David R.				Kilanowsl	ki				
Inventor's Signature	Wavid	R.	Kla	nous	ki	······································	Date (3/23/00)		
Residence: City	Dublin		State	ОН	Country	USA	Citizenship	USA	
Post Office Address				-					
Post Office Address	5783 Rushwoo	d Drive							
City	Dublin	State	ОН	Zip	43017	Country			
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DECLARATION

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Name of Additional Join	t Inventor, if any	/:	A petit	ion has be	en filed for thi	is unsigned inve	ntor			
Given Name (first and middle [i	f any])				Family Name	e or Surname			
Bruce				Monzyk						
Inventor's Signature							Date			
Residence: City	Delaware		State	ОН	Country	USA	Citizenship	USA		
Post Office Address			. 							
Post Office Address	7460 Blaney R	oad								
City	Delaware	State	ОН	Zip	43015	Country	USA			
Name of Additional Joint	t Inventor, if any	': <u> </u>	A petit	ion has be	en filed for thi	is unsigned inver	ntor			
Given Name (f	first and middle [i	f any])				Family Name	e or Surname			
Timothy M			-	Werner						
Inventor's Signature							Date			
Residence: City	Traverse City		State	MI	Country	USA	Citizenship	USA		
Post Office Address								I		
Post Office Address	608 W 7th Street									
City	Traverse City	State	Mi	Zip	49684	Country				
Name of Additional Joint	t Inventor, if any	: 0	A petit	ion has be	en filed for thi	s unsigned inver	ntor			
Given Name (f	first and middle [i	f any])				Family Name	or Surname			
Chad M,				Cucksey						
Inventor's Signature			L	·····			Date			
Residence: City	Columbus		State	ОН	Country	USA	Citizenship	USA		
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Post Office Address	1704 West 3rd	Avenue								
City	Columbus	State	ОН	Zip	43212	Country	USA			
Name of Additional Joint	Inventor, if any	: 🗆	A petit	ion has bee	en filed for thi	s unsigned inver	ntor			
Given Name (f	irst and middle [i	f any])				Family Name	or Surname			
Hamish A. I				McArthur						
Inventor's Signature			<u> </u>		·		Date			
Residence: City	Mystic		State	СТ	Country	USA	Citizenship	USA		
Post Office Address						1		<u> </u>		
Post Office Address	202 Library Str	eet			**					
City	Mystic	State	СТ	Zip	06355	Country	USA	:		

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Name of Additional Joint	Inventor, if any	/:	A petiti	on has be	en filed for thi	s unsigned inver	ntor	
Given Name (f	irst and middle [i	f any])				Family Name	or Surname	
Ted L.				Tewksbu	ſy	······		
Inventor's Signature							Date	
Residence: City	Columbus		State	ОН	Country	USA	Citizenship	USA
Post Office Address	1309 Deerlick	Drive	<u> </u>			· · · · · · · · · · · · · · · · · · ·		
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City	Columbus	State	ОН	Zip	43228	Country	US	
Name of Additional Joint	Inventor, if any	/: <u></u>	A petiti	on has be	en filed for thi	s unsigned inver	ntor	
Given Name (f	irst and middle [i	f any])				Family Name	or Surname	
Inventor's Signature						Water Mercanic Control of the Contro	Date	
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Inventor's Signature			<u>.</u>	· · · · · · · · · · · · · · · · · · ·			Date	
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City		State		Zip		Country		
Name of Additional Joint	Inventor, if any	. 🗆	A petiti	on has bee	en filed for this	s unsigned inver	ntor	
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inventor's Signature			L				Date	
Residence: City			State		Country		Citizenship	
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City		State		Zip		Country		

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DECLARAT	ION FOR UTILITY OR	Attorney Docket Number	PC10433A			
	DESIGN	First Named Inventor	Harold N. Conkle			
PATEN	IT APPLICATION	COMPLETE IF KNOWN				
(3	7 CFR 1.63)	Application Number	09/701,760			
Declaration submitted	Declaration Submitted after Initial	Filing Date	November 30, 2000 (USA) February 25, 2000 (PCT)			
with Initial Filing (surcharge Filing 37 CFR 1.16 (e))		Group Art Unit	Not Yet Assigned			
	required)	Examiner Name	Not Yet Assigned			

As a below named inventor	r, I hereby decla	are that:				
My residence, post office add	dress, and citize	nship are as stated I	pelow next to my n	ame.		
l believe I am the original, firs names are listed below) of th	st and sole inver e subject matter	itor (if only one name which is claimed ar	e is listed below) or id for which a pater	r an original, first an nt is sought on the i	d joint inventor (if nvention entitled:	plural
METHOD FOR THE PURIF	ICATION, RECO	OVERY, AND SPOR	ULATION OF CYS	STS AND OOCYST:	5	
the specification of which is attached hereto		(Title of	the Invention)			
was filed on (MM/DD/	/YYYY) 02/2	25/2000	as PCT	International		
	/US00/04733	and was amended (MM/DD/YYYY)			(if applicab	•
I hereby state that I have revi amended by any amendment	iewed and under t specifically refe	stand the contents of	of the above-identif	fied specification, in	cluding the claims	s, as
I acknowledge the duty to dis	close informatio	n which is material t	o patentability as d	efined in 37 CFR 1.	56.	
I hereby claim foreign priority certificate, or 365(a) of any F America, listed below and ha or of any PCT international a	PCT internationa ve also identified	l application which d d below, by checking	esignated at least the box, any foreign	one country other the	nan the United Statent or inventor's	ates of
Prior Foreign Application Number(s)	Country		n Filing Date 'DD/YYYY)	Priority Not Claimed	Certified Co YES	py Attached? NO
Additional foreign application	n numbers are li	sted on a supplemer	ntal priority data sh	eet PTO/SB/02B at	tached hereto:	
I hereby claim the benefit und	der 35 U S C. 11	9(e) of any United S	tates provisional a	pplication(s) listed b	elow:	
						
Application Number	(s)	Filing Date (N	IM/DD/YYYY)			

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	DECLARAT	TION -	Utility	y or De	sign Pate	ent Appl	ication
United States United States information w	s or PCT International applicat	id, insofar iion in the iy as define	as the subject manner provide ed in 37 USC	matter of ear	ch of the claims	of this applica	on designating the tion is not disclosed in the prior acknowledge the duty to disclose filing date of the prior application
U.S. Parent	Application Number or PC Number	T Parent	Parent I (MM/D	Filing Date DD/YYYY)			Patent Number pplicable)
Addition	al U.S. or PCT International appl	cation numb	l pers are listed on	a supplementa	I priority data shee	t PTO/SB/02B at	tached hereto
As a named in	iventor. I hereby appoint the follo	wing registe	red practitioner(s	s) to prosecute	this application and	to transact all b	usiness in the Patent
and Trademar	k Office connected therewith	Custor	mer Number or				Place Customer Number Bar Code Label here
			ered practitioner	(s) name/regist	ration number liste	d below	
	Name		Registration Number		Name	e	Registration Number
Peter C. Ri			27,526	A	. Dean Olson		31,185
Allen J. Spi			25,749		lervin E. Brokk	-	32,723
Paul H. Gir J. Trevor Li	ŭ		28,718		alerie M. Fedo		33,688
James T. J			28,567 30,561		ryan C. Zielins obert T. Ronaı		34,462
Grega C. B	· ·		30,977		. Timothy Crea		36,257 39,156
Robert F. S	•		31,304		lan L. Koller	igari	37,371
Grover F. F			31,760		olene W. Apple	eman	35,428
Karen DeB			32,977	K	ristina L. Kons	tas	37,864
Lorraine B.	<u> </u>		35,251	s	eth H. Jacobs		32,140
Garth Butte	1		36,997		lartha A <u>.</u> Gamr		31,820
Carl J. God Raymond N			39,203		regory P. Rayı		36,647
Jennifer A			26,810 40,049	L L	. Victor Donah	ue	35,492
Israel Nisse			27,582		oy F. Waldron odd M. Crissey	,	42,208 37,807
Adrian G. L			41,406		eborah A. Mar		44,222
A. David Jo			37,858	l l	effrey N. Myers		41,213
Lawrence C			28,587		lsa Ďjuardi		45,963
Gabriel L. K			40,681		ichelle A. Sher		36,271
Donna R. G	Grossu nal registered practitioner(s) nam	ed on supple	P-47,248		rlene K. Musse		37,895
	respondence to: Cus	stomer Nur Bar Code L	mber	od i idealonei	mornator sheet		Correspondence address below
Name	Paul H Ginsburg						
Address	Pfizer Inc						
Address	235 East 42nd Street, 20th	Floor					
City	New York		State	New Y	ork	Zip Code	10017-5755
Country	United States Of America	Te	elephone		73-2369	Fax	(212)573-1939
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Given Nam		Family Name or Surname							
Harold N.				Conkle					
Inventor's Signature							Date		
Residence: City	Columbus		State	Ohio	Country	USA	Citizenship	USA	
Post Office Address					- 	w!			
Post Office Address	875 Kenridge	Court							
City	Columbus	State	ОН	Zip	43220	Country	USA		

DECLARATION

Name of Additional Join	t Inventor, if an	/: [☐ A petit	ion has be	en filed for thi	s unsigned inve	ntor		
Given Name (first and middle [if any])					e or Surname		
Joseph E.				Schultz					~~~
Inventor's Signature		A all					Date		
Residence: City	Camarillo		State	CA	Country	USA	Citizenship	USA	
Post Office Address		***************************************				L		I	
Post Office Address	11675 Barrand	a Road				T		**************************************	
City	Camarillo	State	CA	Zip	93012	Country	USA		
Name of Additional Join	t Inventor, if any	/: [A petiti	on has be	en filed for this	s unsigned inve	ntor		
Given Name (first and middle [i	f any])				Family Name	e or Surname		
Scott J.				Blonigen					
Inventor's Signature			I				Date		
Residence: City	Hilliard		State	ОН	Country	USA	Citizenship	USA	
Post Office Address									
Post Office Address	3325 River Na	rrows Ro	oad						
City	Hilliard	State	ОН	Zip	43026	Country	USA	**************************************	
Name of Additional Joint	t Inventor, if any	': [A petiti	on has be	en filed for this	s unsigned inve	ntor		
Given Name (f	first and middle [ı	f any])		**************************************		Family Name	or Surname		
Fred H.				Weber					
Inventor's Signature	Fred 2	. W-					Date 27 DEC 00		
Residence: City	Terre Haute		State	IN	Country	USA	Citizenship	USA	
Post Office Address									
Post Office Address	159 Phoenix C	ourt							
City	Terre Haute	State	IN	Zip	47803	Country	USA		
Name of Additional Joint	Inventor, if any	: [☐ A petiti	on has bee	en filed for this	s unsigned inver	ntor		
Given Name (f	irst and middle [i	f any])				Family Name	***************************************		
David R.				Kilanowsk	(i	<u> </u>			
Inventor's Signature							Date		
Residence: City	Dublin		State	ОН	Country	USA	Citizenship	USA	
Post Office Address					<u> </u>				
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City	Dublin	State	ОН	Zip	43017	Country			

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DECLARATION

Name of Additional Join	t Inventor, if any	/:		A petit	ion has be	en filed for thi	is unsigned inve	entor	
Given Name (first and middle [f any])				Family Nam	ne or Surname	
Bruce					Monzyk				
Inventor's Signature								Date	
Residence: City	Delaware			State	ОН	Country	USA	Citizenship	USA
Post Office Address									
Post Office Address	7460 Blaney Road					J. 44.			
City	Delaware	Stat	te	ОН	Zip	43015	Country	USA	
Name of Additional Join	t Inventor, if any	′ :		A petiti	on has be	en filed for thi	s unsigned inve	entor	
Given Name (first and middle [i	f any])				Family Nam	e or Surname	
Timothy M					Werner				
Inventor's Signature								Date	
Residence: City	Traverse City			State	MI	Country	USA	Citizenship	USA
Post Office Address				· · · · · · · · · · · · · · · · · · ·	-1		<u> </u>		
Post Office Address	608 W. 7th Str	eet					**		
City	Traverse City	Stat	te	МІ	Zip	49684	Country		
Name of Additional Join	Inventor, if any	:		A petiti	on has bee	en filed for thi	s unsigned inve	entor	
Given Name (t	irst and middle [i	f any]))				Family Nam	e or Surname	
Chad M.					Cucksey				
Inventor's Signature								Date	
Residence: City	Columbus			State	ОН	Country	USA	Citizenship	USA
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Post Office Address	1704 West 3rd	Aveni	ue					····	
City	Columbus	Stat	e	ОН	Zip	43212	Country	USA	
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Given Name (f	irst and middle [r	fany]))				Family Name	e or Surname	
Hamish A. I.					McArthur				······································
Inventor's Signature								Date	
Residence: City	Mystic			State	СТ	Country	USA	Citizenship	USA
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City	Mystic	Stat	е	СТ	Zip	06355	Country	USA	
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DECLARATION

Name of Additional Join	t Inventor, if any	<u>′: </u>	A petiti	on has be	en filed for thi	s unsigned inve	ntor	
Given Name (:	first and middle [i	f any])				Family Name	e or Surname	
Ted L.				Tewksbui	Ύ			
Inventor's Signature			· · · · · · · · · · · · · · · · · · ·				Date	
Residence: City	Columbus		State	ОН	Country	USA	Citizenship	USA
Post Office Address	1309 Deerlick	Drive	1		·	1		1
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City	Columbus	State	ОН	Zip	43228	Country	US	
Name of Additional Joint	t Inventor, if any	:	A petiti	on has bee	en filed for thi	s unsigned inver	ntor	
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DECLARAT	ION FOR UTILITY OR	Attorney Docket Number	PC10433A		
	DESIGN	First Named Inventor Harold N. Conkle			
PATEN	IT APPLICATION	COMPLETE IF KNOWN			
(3	7 CFR 1.63)	Application Number	09/701,760		
Declaration submitted	Declaration Submitted after Initial	Filing Date	November 30, 2000 (USA) February 25, 2000 (PCT)		
with Initial Filing	Filing (surcharge 37 CFR 1.16 (e))	Group Art Unit	Not Yet Assigned		
	required)	Examiner Name	Not Yet Assigned		

As a below named invento					
	r, I hereby declare th	at:			
My residence, post office ad-	dress, and citizenship	are as stated below next to my na	ame.		
I believe I am the original, firmames are listed below) of the	st and sole inventor (it ie subject matter whic	only one name is listed below) or h is claimed and for which a pater	r an original, first ar nt is sought on the i	id joint inventor (i nvention entitled:	f plural
METHOD FOR THE PURIF	ICATION, RECOVER	Y, AND SPORULATION OF CYS	TS AND OOCYST	S	
the specification of which		(Title of the Invention)			
☐ is attached hereto OR					
	/YYYY) 02/25/20	00 as PCT	International		
Application Number PCT		was amended on I/DD/YYYY)		(if applicat	ole)
I hereby state that I have rev	iewed and understand	the contents of the above-identif	led specification, in	l cluding the claim	s, as
amended by any amendmen					
i acknowledge the duty to dis	sclose information whi	ch is material to patentability as d	efined in 37 CFR 1.	56.	
certificate or 365(a) of any f America, listed below and ha	PCT international applive also identified belo	S.C. 119(a)-(d) or 365(b) of any fo ication which designated at least w, by checking the box, any foreic	one country other t	nan the United St	ates of
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Prior Foreign Application Number(s) Additional foreign application	Country n numbers are listed o	ng date before that of the applicat Foreign Filing Date (MM/DD/YYYY) on a supplemental priority data sh	eet PTO/SB/02B at	y is claimed. Certified Co YES	s certificate, ppy Attached?
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Allen J. Spi				25,749		rvin E. Brokk		ŀ		32,723	
Paul H. Gin J. Trevor Lu				28,718		erie M. Fedo		ŀ		33,688	
James T. J				28,567 30.561		ran C. Zielinsl bert T. Ronau				34,462	
Gregg C. B				30,977		Timothy Crea		İ		36,257 39,156	
Robert F. S				31,304		n L. Koller	gan	ŀ		37,371	
Grover F. F				31,760		Jolene W. Appleman				35,428	
Karen DeB				32,977		stina L. Konst		1		37,864	
Lorraine B.	~			35,251	I	h H. Jacobs				32,140	
Garth Butte				36,997		rtha A. Gamn				31,820	
Carl J. God Raymond N				39,203		egory P. Rayr				36,647	
Jennifer A.				26,810 40,049		√ictor Donahı y F. Waldron	ie.	1		35,492 42,208	
Israel Nisse	•			27,582		dd M. Crissev	,			37,807	
Adrian G. L	ooney			41,406	Deborah A. Martin					44,222	
A, David Jo				37,858		frey N. Myers					
Lawrence C				28,587	Elsa Djuardi					45,963	
Gabriel L. K Donna R. G				40,681		Michelle A. Sherwood Arlene K. Musser			36,271		
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Address	Pfizer Inc						····				· · · · · · · · · · · · · · · · · · ·
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Harold N.				Co	onkle						· · · · · · · · · · · · · · · · · · ·
Inventor's Signature	-							Date			

Residence: City Columbus State Ohio Country USA Citizenship USA

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Zip Additional inventors are being named on the $\underline{3}$ a supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

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	t Inventor, if any	/: L	A petit	ion has bee	en filed for this	s unsigned inve	ntor	
Given Name (first and middle [i	f any])				Family Name	or Surname	
Joseph E.				Schultz				
Inventor's Signature							Date	
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Post Office Address	11675 Barranc	a Road						
City	Camarillo	State	CA	Zip	93012	Country	USA	
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Given Name (f	first and middle [i	f any])				Family Name	or Surname	
Scott J.				Blonigen				
Inventor's Signature			· · · · · · · · · · · · · · · · · · ·				Date	
Residence: City	Hilliard		State	ОН	Country	USA	Citizenship	USA
Post Office Address				······································	+			
Post Office Address	3325 River Na	rows Roa	d					***************************************
City	Hilliard	State	ОН	Zip	43026	Country	USA	
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Fred H.				Weber				
Inventor's							~,	
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Residence: City	Terre Haute		State	IN	Country	USA	Date Citizenship	USA
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Name of Additional Joint	Inventor, if any	:	A petit	ion has bee	en filed for thi	s unsigned invei	ntor	
Given Name (fi	irst and middle [ii	f anyl)			***************************************	Family Name	e or Surname	
Bruce				Monzyk			AUGUA AUGUA	
Inventor's Signature	Buce	~ A	Jo	17/			Date 12/30/2000	
Residence: City	Delaware		State	OH OH	Country	USA	Citizenship	USA
Post Office Address			·			I		L.,
Post Office Address	7460 Blaney R	oad						
City	Delaware	State	ОН	Zip	43015	Country	USA	
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Given Name (fi	rst and middle [it	fany])				Family Name	e or Surname	
Timothy M.				Werner				
Inventor's Signature							Date	
Residence: City	Traverse City		State	MI	Country	USA	Citizenship	USA
Post Office Address			 		1	L		· · · · · · · · · · · · · · · · · · ·
Post Office Address	608 W 7th Stre	eet						
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Given Name (fi Chad M. Inventor's			A petit		en filed for thi		e or Surname	USA
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Given Name (fi Chad M. Inventor's Signature Residence: City Post Office Address Post Office Address	Columbus 1704 West 3rd	Avenue State	State OH	Cucksey	Country 43212	Family Name	Date Citizenship USA	USA
Given Name (fi Chad M. Inventor's Signature Residence: City Post Office Address Post Office Address City Name of Additional Joint	Columbus 1704 West 3rd Columbus	Avenue State	State OH	Cucksey	Country 43212	Family Name USA Country s unsigned inver	Date Citizenship USA	USA
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Given Name (f	irst and middle [ı	f any])				Family Name	or Surname	
Ted L.				Tewksbur	У			
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Residence: City	Columbus		State	ОН	Country	USA	Citizenship	USA
Post Office Address	1309 Deerlick	Drive		<u> </u>				
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